AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

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ESTABLISHED IN 1831.

PUBLISHED WEEKLY BY J. H. SCHULTZ & CO., AT NO. 9 SPRUCE ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. X., No. 1.] SATURDAY, JANUARY 7, 1854. [WHOLE No. 925, VOL. XXVII.

☞ The *Mechanical Engineering* department of this paper will be under the charge of Mr. ZERAH COLBURN.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., No. 9 SPRUCE ST.

Saturday, January 7, 1854.

☞ Persons, wishing for back numbers of the *Railroad Journal* for 1853, must send for them immediately.

Railway Property unsafe in Pennsylvania.

The recent outrages committed by the citizens of Erie upon the property of the Erie and Northeast, and the Erie and Cleveland Railroads, have an importance far beyond the destruction, if such is to be the result, of the two roads. It is worth our while to inquire how far the spirit displayed is common to the State, and whether a similar disposition would not manifest itself, under similar circumstances, in every portion of it, which at Erie has broken out in acts of brutality and destruction.

In the first place the Erie outrages have been *acquiesced* in by every portion of the State. We have not been able to observe the least mark of *disapprobation* from any quarter. The Press has been silent, except in expressions of sympathy with the rioters. No public meetings have been held to denounce their conduct. The constituted authorities, who by their offices are the conservators of the property and peace of society, have remained entirely inactive. Such negatives certainly indicate a remarkable want of that high-toned moral sentiment upon which *security* of persons and property rests. We do not believe that the outrages complained of could have been committed in any *other* State, without calling for such interference from the local authorities, and such a condemnation, as would have crushed in the *bud* every act of violence, as we may infer from the universal condemnation, *out* of Pennsylvania, which the outrages have called forth.

Such is the *negative* side of the case. There is a *positive* side vastly more significant and disgraceful. The *Press* of the State, as far as we have opportunities of observing, have invariably expressed sympathy with the rioters. The Governor has written a letter which could have no other effect than to encourage them in their work of destruction. The courts of the State have at length interfered, but the rioters, under the belief, undoubtedly, that as they must be tried, if tried at all, by a Jury of their *neighbors*, which would render conviction impossible, have, thus far, treated the orders of the legal tribunals with contempt. Such is a statement of the present condition of affairs. Let us see who are the real parties to the quarrel, and who, in the end, are to be the sufferers.

The Pennsylvanians tell us that it is a contest against the grasping ambition of New York, which would sacrifice the rights of individuals and communities in the accomplishment of her selfish aims. We showed in our last that this city has very little interest or feeling in the matter; that she is indifferent whether western trade and travel reaches her over the Lake Shore, or the Pennsylvania lines. She aids the construction of the latter with the same freedom that she has the most important roads within her own territory. New York distrusts no rival, simply for the reason that she believes she has none. The real contest, therefore, is between Pennsylvania and all parties in any way interested in the Lake Shore lines, which includes every person interested in *all* of the *western* roads, as well as New York and New England; as the value of their property will be directly affected by the destruction of the Lake Shore line. Every man who has a cent invested in such roads, is a direct party to the quarrel, and is watching with anxiety, the result. The interests of capitalists throughout the world, to a considerable extent, are at stake. *They* are one of the parties who are to suffer.

Whatever may be the issue of the present contest going on at Erie, as far as the two roads are concerned, the great sufferer in the end will be the State of Pennsylvania, whose character and credit has been most seriously damaged. She has inflicted a stain upon herself which years cannot efface. The wrong that has been done will be aggravated by the *defaults*, from which she suffered so much, a few years since. To these is to be ascribed the fact that in enterprize, and in public works, the result of good credit, Pennsylvania is far behind New York, though possessing far greater resources in her soil. If the State could not borrow money in her collective capacity, much less could *private* companies. The consequence was that a paralysis rested upon all the enterprizes of that State, while those of New York were pushed forward with extraordinary vigor and success. A comparison of the public works of the two States will show the extent to which Pennsylvania suffered from the causes referred to. But the resumption of payment had been attended by its natural results. It gave credit to private companies; and this State was just starting upon a new career, which promised the most brilliant results, and to compensate in some degree for the time that had been lost. In every portion of her extensive territory, railroads would have supplied just the facilities wanted for the development of her vast resources. But these bright prospects have been suddenly dashed to the ground, by the display of a sentiment, compared with which, default of the payment of just debts is a virtue. Instead of *withholding*, for which a partially satisfactory subterfuge can be framed, the people of this State have commenced a war of *aggression* upon the property of distant creditors. What will be the reply of these parties to the Railroad companies, when they apply to them for money, without which the numerous works now in progress in that State cannot proceed? Will not the following be the common, "Gentlemen, experience has shown that railroad property in your State is unsafe. What we already have has been attacked and destroyed, apparently by universal consent. Your Governor has, indirectly at least, encouraged the outrages we have suffered. The public Press of the State has done the same. Under such a state of things we are not giving place to any more of our money in a position where it is liable to be fallen upon and destroyed any day by an infuriated mob,

shielded from punishment by the general sympathy." *This* is the aspect which the quarrel has assumed and such will be the result. The credit of the railroad companies of the State has suffered a far more fatal blow than did the *State* credit for the defaults a few years since. The conveyances will be vastly more disastrous. There is no State in the Union which stands more in need of foreign capital than Pennsylvania and none in which it would accomplish more good.

To destroy this credit when most wanted, is a fatal mistake, and one which years cannot redeem. Upon the Railroad companies of the State will fall no small portion of the penalty for the Erie outrages.

While the City of New York is indifferent as to the channels through which the trade of the West is to reach her, we find that the western people are by no means disposed to submit their rights to Pennsylvania dictation. Meetings have already been held in many of the principal western cities, denouncing the Erie outrages, and declaring a determination to discontinue all business relations with Philadelphia, so long as these outrages are persisted in and tolerated. We know that the whole West is most thoroughly disgusted at the narrow and bigoted policy which has too often characterized the Legislation of Pennsylvania. This feeling cannot fail in exciting a decided influence in turning to other cities a large portion of western trade now going to Philadelphia. The Erie affair in the end, can have no other issue than the one exactly opposed to that sought to be gained, which in its general influence, must inflict a lasting and serious blow upon the railroad enterprizes of the State.

Locomotive Building in Paterson.

Paterson, once the active competitor of Lowell in the cotton manufacture, has acquired a deserved celebrity for the production of railway machinery. The former city bears the same relation to locomotive building that the latter sustains to the cotton manufacture. And as Lowell has its market in Boston, so Paterson supplies orders which must naturally be attracted to *New York*.

At the present time there is a large amount of work in progress in the shops at Paterson. At Rogers', *nine* engines are building monthly. Additional room and power have been provided, and a portion of the works, heretofore devoted to cotton machine and tool making, have been occupied for locomotive work. The general features of the engines built at these works have not been materially changed since the commencement of the year, at which time *level cylinders* were adopted where admissible by spreading the trucks, and at which time also the engines were generally fitted with Hackworth's double exhaust ports. A sensible advantage is found to attend the working of this latter arrangement. The cylinder face has two exhaust ports, each having half the usual width, and separated by a bar of from 1¼ to 1½ inches in width. The valve has two bars cast across its face in such manner as to close both the exhaust ports at mid-throw, giving a lap, generally of 3-16ths inch, on each side. At the same time an allowance of "inside clearance", of 3-32 inch, is made by opening the cavity of the valve 3-16ths wider than the distance between the inner edges of the steam ports. At a moment just before the exhaust at each stroke, the steam passes, through the valve, from one end of the cylinder to the other, giving much of the effects of *lead* without waste of steam. Although the exhaust is slightly delayed, it is effected through two ports instead of one; so that at the commencement of the stroke the whole lead on the exhaust is much more than that allowed with a single port.

The operation of this valve, with steam ports 1¼ inches wide and exhaust ports 1⅛ inches each; 11-16 inch outside lap, 3-32 inside clearance, and bars in the valve each 7-16 inch wider than the exhaust ports which they cover—is as follows.

Throw of Valve.	Lead on Steam Port.	Lead on Exhaust.	Steam cut off, in in's of 22 inches stroke.	Steam enters the valve in in. of 22 in. stroke.	Steam Exhausts do.	Pre-admission of Steam ditto.
in.	in.	in.	in.	in.	in.	in.
4 5-8	1-16	1 1-16	20	21¼	21¾	1-32
2 15-16	3-16	1 5-16	16	19⅛	20¾	1-8
2 5-8	1-4	1 7-16	14	18⅛	20¼	1-4
2 1-2	1-4	1 7-16	12½	17⅜	19¾	3-8
2 1-4	1-4	1 7-16	11	16⅞	19¼	1-2

Another evident advantage of Hackworth's valve is that it affords a better distribution of the wearing surface, being less likely to wear concavely. The great length of steam ports and breadth of valve, used for the link motion, make this an important point of superiority.

The New Jersey Locomotive and Machine Co., under the efficient superintendence of Mr. John Brandt, is turning out some of the best locomotive work ever made in this country. The materials are of the choicest kind, being mostly supplied under special contracts with manufacturers of the very best kinds of American stock. The cylinder fastenings, link motions, frames, pedestals and braces, and the trucks, are among the best specimens of heavy and thorough work. The pumps (wholly of brass), double domes, wrought iron rockers, &c., are also made in a style corresponding with the most elaborate description of engine work. This Company have lately been placing some excellent engines upon the New York Central, Hudson River, Philadelphia and Columbia, and other home roads.

William Swinburne is doing a large business for western roads, besides having filled some recent orders for the *Erie*. The manner in which Mr. Swinburne is fitting up his link motions is worthy of being copied. The suspended or stationary link is used, the valve arm or radius rod being forked to embrace the block on both sides. The arm on the lifting shaft is forked also at its end, and two lifting links with long hubs are applied one on each outside of the valve arm and lifting arm. The links are held by sustaining links on each side, whereby all tendency to twist the links is corrected.

Messrs. Danforth, Cooke & Co. have completed two of the heavy freight engines for the NewYork and Erie Road. These are *expansions* of the plan of the passenger broad gauge engines, built by Rogers in 1851, but are hardly "the thing" for a freight engine. They are of extreme size, being principally as follows:

18 inch cylinders; 20 inches stroke; Inside connection; four drivers, 5 feet 2 inches diameter and truck. Boiler 48 inches diameter and containing 197 tubes, 2 inches in diam. and 10 ft. 9 inches long. Furnace grate 57 by 48 inches. Steam ports 16 by 1 5-8 in. Weight of *each cylinder* in rough 1900 lbs. Weight of engine in running order 81½ tons.

These engines are of excessive weight, without a proper distribution. The proportion of cylinders and wheels are not such as are best suited to the grades of the Eastern and Western divisions of the road. The tubes are too near together, although in the second engine we believe the number was reduced and the distance apart increased. The capacity of boiler does not appear to be large enough and it is perhaps a question if the extension of the furnace at the expense of the tubes will yield the best result. From the results obtained in the use of outside connected engines on the Erie road there is no doubt that *that* is the arrangement best adapted for the freight engines. The excess of weight and especially of disturbing weight, and the increased difficulty of balancing the latter, operate against the inside connection.

These remarks bear no reference to the manner in which Danforth, Cooke & Co. have filled their contract, as the designs of these engines were furnished to them in minute detail, while the mechanical execution is of the highest order.

Z. O.

Traction and Adhesion of a Locomotive.

An engine built by Messrs. Dodds and Son, of Rotherham, England, for a railroad in Spain, was tried on the "Lickey Incline" of the Birmingham and Gloucester Railway, for the purpose of testing its capacity for working trains upon grades. The particulars of the engine and load, grades, etc., were as follows:

Diameter of Cylinder.....14½ inches.
Length of stroke.....20 "
Diameter of Driving wheels.....54 "

4 Drivers supporting ⅔ the entire weight of the engine,

Weight of engine in working order... 42,560 lbs.
" " tender loaded..... 13,104 "
" " train, 6 carriages.....102,228 "
Pitch of grade, (143 feet per mile,)...1 in. 37
Length of grade.....2⅛ miles.
Time of ascent.....12 m., 12 s.

Train started at the foot of incline without assistance, and the speed steadily increased until the engine reached the summit. At the time there was a drizzling rain.

RESISTANCES.

Gravity of train on incline.....2,763 lbs.
" " engine and tender.....1,504 "
Ordinary friction of engine gear..... 114 "
Extra friction due to weight of train.... 454 "
Extra friction due to resistance on grades..... 533 "
Axle friction of engine and tender..... 223 "
Axle friction of train..... 364 "

Total.....5,546½

Equal to a pressure of 78¾ lbs. throughout stroke of piston, over and above the resistances of the exhaust and blast, and equal to 10-51 the adhesive weight of the engine. Notwithstanding the state of the rails the engine did not slip at all. It is probable, considering the speed made, equal to 19¾ miles per hour at the moment of reaching the summit, that the resistances were at least 5,000

pounds, equal to 10-49 of the adhesive weight of the engine.

This engine has 137 tubes 1⅞ inches in diameter, and 11 feet 8 inches long. Single blast pipe 3¾ inches in diameter. Z. C.

Report of the Directors of the New York and Erie Railroad Company to the Stockholders.

(Continued from Page 836.)

IV.—THE RESOURCES FOR BUSINESS LOCAL AND FOREIGN, AND THE SHARE OF THE WESTERN TRADE AND TRAVEL DUE TO THE NEW YORK AND ERIE RAILROAD, FROM ITS POSITION AND FACILITIES.

In a subsequent place, the local resources of this Road are stated; but the examination of this question would be incomplete, if it were limited to the territories, which are adjacent to its line, of nearly five hundred miles of main trunk, and twice that length of tributary roads and water ways, within this State.

The New York and Erie Railroad, like the Erie Canal, is so essentially national in its characteristics, that the vast territory of *the West* must be considered by those who would adequately comprehend the causes, which have already furnished a business, which has surpassed the warmest anticipations of its early friends. Some reflections of a desultory character, thrown together as generally illustrative of this branch of inquiry, will suggest to the reader many other considerations which it might seem tedious to particularise in this place.

The rapid settlement of those vast and fertile regions lying north of the Ohio and east of the Mississippi, is unparallelled in the annals of any other country, and every acre of the wilderness subdued by this mighty march of civilization, developes new resources of profitable business, for the railroads and waterways. These again facilitate the settlement of those regions and conduce directly and powerfully, to the welfare of the New York and Erie, and the other main trunk lines, between the Atlantic and the West.

This being the only Railroad, constructed and managed by a single Company, between the commercial metropolis and the inland seas, turning the northern bank of the Allegany Mountains by easy grades and curves, forming a continuous gauge, the broadest in America, on one of the few routes by which a railroad is practicable between New York and the vast region drained by the Western Lakes and the Mississippi,—it could never be reasonably doubted, that it would share largely in the immense trade and travel from that region, which from the converging lines of the waterways and railroads, are thrown into the narrow throat lying between the northern extremity of the Allegany Mountains and Lake Erie, from which this road starts.

More than three thousand miles of railroads are now in operation, west of the terminus of this road and north of the Ohio, and as many more miles are actually in progress, altogether omitting those built and in progress south of the Ohio.—From its western terminus, also, extends a continuous chain of more than one thousand miles of lake navigation, with five hundred miles of navigable rivers and twelve hundred miles of canals, uniting the waters of the lakes with those of the Ohio, Wabash and Illinois Rivers, and through them, with the Mississippi and its twenty thousand miles of connected navigation.

From its geographical position, the New York and Erie Railroad is the first line, which intercepts the immense flood of trade, which is thrown by these railroads and waterways, through this narrow throat, and it must, consequently, ever continue to receive the largest share thereof.

The progress of no other country furnishes adequate data, for determining the ratio of advancement in this; and even the wonderful results of the past progress of the West, will fall short of the future, when the full effect of those numerous railroads and water courses is realised. The construction of each mile of new railroad in that region, is directly or indirectly, increasing the trade and travel, which must pass to the Atlantic over these roads; and in like manner, they are interested in every improvement in the manner, or reduction in the cost, of transportation on the lakes, rivers, canals and railroads, which contribute to the prosperity, and increase the ability of the Western multitudes, to sustain the traffic to the sea-board. These water lines are thus, in almost every case, auxiliaries, instead of rivals, to the great lines of railroads.

The trade between the Atlantic sea-board and that fertile region of the great West, which lies north of the Ohio, is already taxing the existing channels of commerce, to their utmost capacity.

The annual agricultural and animal productions of this region, exceed twenty millions of tons; and its surplus products, requiring transport to an Atlantic market, together with the return freight, is believed to be over five millions of tons. The New York and Pennsylvania Canals and Railroads, now convey about three millions of tons of this trade annually.

Enlarged channels, for this vast internal commerce, have become indispensable. The State of New York has already taken steps to complete the enlargement of the main artery; but before this is accomplished, the State and private works already constructed, will be found inadequate.

When the Erie Canal is enlarged, the increased facilities and diminished cost of transport, which it will afford, will vastly increase the trade through this State, and will by these means, also correspondingly increase the travel which must pass over the main lines of railroads. Those articles of freight which require, or will bear the expense of railroad transport, will also be increased to an extent that will tax to their full capacity, all the railroads now built between the Atlantic and the West.

The high northern latitude closes the water lines between the East and the West, for one-third of the year, The interchange of commodities, and the trade between those districts have undergone a sensible change within the last dozen years; and, though the water lines have lost none of their importance, so far as regards the conveyance of the heavy commodities, yet the demands of a concentrated population at the East, require the means of a speedy conveyance, of the more perishable articles of use and consumption, as well as of a rapid communication for the moving multitudes, whom the relations of business or pleasure, require to pass between the East and West.

West of the Mississippi there are not now one hundred miles of railroad in operation. The well informed men of that region confidently assert, that within ten years, they will construct more than five thousand miles. It is difficult to bring the mind to appreciate the effect on the New York and Erie, of the completion of those roads only, which the least sanguine concede will be built west of its Erie terminus, as well as from the increase of traffic on those already constructed.

The social and business habits of the people of the West must be considered, in estimating the resources of the railroads connecting them with the East. No equal amount of population in the world, possess means for travel like those of the Western people; and their intimate business and social relations with the East, (from whence so many of them have emigrated) lead to frequent interchanges of visits with friends in that region.

No other country presents a parallel to the wide distribution of the members of families, nor does any other present similar facilities, for frequent re-unions at each others homesteads, whether they be hundreds or thousands of miles apart.

This interchange of sociality, is one of the main elements of the prosperity of our railroads; and what railroad is, or ever can be, better situated than the New York and Erie, for reaping a golden harvest from this immense and increasing cause?

The States of Ohio, Indiana, Illinois and Wisconsin, each extend from the Lakes to the Ohio or Mississippi, and are connected with both, by four great lines of canal. Michigan and the peninsula of Upper Canada, are nearly surrounded by the great chain of navigable Lakes.

This same territory is intersected, as has been mentioned before, by a network of railroads, which, with the water lines, converge towards the Eastern end of Lake Erie, and concentrate in that narrow gorge, an amount of trade and travel which is not to be found elsewhere on this continent.

The New York and Erie Railroad, taps this trade in four places: first, intercepting it at Dunkirk with its main trunk, and subsequently by its tributaries at Buffalo, Tonawanda, Niagara Falls and Youngstown, and delivers it at the greatest commercial point on the continent, to which the chief part of it is directed.

It should be borne in mind, that the Erie is still a new route, without that complete organization of itself and its tributaries which its competing rival possesses, from the greater length of time which its business has been established.

Railroads are rapidly taking the place of the common highways of the country, and especially through the Western States, where the soil, so admirably adapted for agricultural purposes, for that reason, is generally unfitted for the construction of even passable turnpikes.

The high value of the time of the traveller in this country, and the circumstances before stated, have rendered the railroad an element of necessity. The passenger by Railroad, travels six times the distance per day that he does by stage coach. The average value of the daily time of railroad travellers, is not less than two dollars per day. The saving is therefore ten dollars a day on each, which applied to the whole railroad travel of the United States, would be sufficient to pay the interest on the cost of all the Railroads that have been built in the Union.

Railroads have penetrated regions which were inaccessible to canals, and by cheapening the cost of transport, have increased the value of the adjacent property, equal to their cost. The difference in the cost of transport of agricultural products, saved by rail, over the common highway, is equivalent to adding to the adjacent farms, ten cents per acre for every mile of distance, that such commodities are moved on rail, instead of the common road. If the farmer, before a railroad was built, had been obliged to convey his products one hundred miles over a common road, the building of a railroad, for this distance, would be equivalent to increasing the value of his farm ten dollars an acre.

These railroads have already produced an important effect, in equalizing to a certain extent, the summer and winter prices of agricultural products on the Atlantic, and of merchandise and manufactured articles in the interior.

The crops of the country are harvested so late, that a large portion of them, cannot be sent to market until the following season, in consequence of the water lines being then, either thronged with business, or closed by ice. The railroads afford a constant communication for the whole year, and by means of their rapid transport, enable the producer to avail himself of the advanced prices, which frequently take place, after the water lines are closed.

These are additional reasons for believing that the main trunk lines will be hereafter occupied to their full capacity, and at remunerative prices.

The facilities which the New York and Erie Railroad has given for quick and cheap transport to the best market in the country, has been an incentive to a large production for export along the route, and has caused a rapid increase in the settlement and cultivation of the contiguous lands. The establishment of every new branch of industry, the cultivation of each additional acre, and the settlement of every family along the line, forms an additional source of permanent revenue to the road.

The lumber cleared from the land, is followed immediately by its settlement; and though the transportation of lumber is the least profitable branch of business done, it is a subject worthy of careful attention, whether provision should not be made for carrying it, at remunerative prices, at least to the nearest shipping place by water, for the advantage which will ultimately be received, in the permanent revenue arising from the conveyance of the agricultural products of the land thus cleared, and that of other freights and passengers incident to its settlement. The population of the district through which the road passes, or from which it draws its trade and travel, was about seven hundred and fifty thousand in 1850, and had increased nineteen per cent. in ten years. The present population exceeds eighteen hundred thousand. The valuation of the real estate in 1852, of those portions of the above mentioned district within the State of New York, was one hundred and fifty millions of dollars, and of the assessed personal estate, twenty-two millions.—The number of acres of Improved Lands in 1845, was nearly three millions, it now exceeds five millions of acres, including those in New Jersey and Pennsylvania. The value of the manufactured articles in mills and tanneries, was more than ten millions of dollars in 1845. The value of the annual products of the dairies, lumber, coal and cereal products, amounted to over twenty millions of dollars in 1840, and including the manufactured articles, now probably exceed sixty millions of dollars annually.

In the older countries of Europe, the business of their railroads arrives nearly at a maximum, a few years after they are opened; and to a certain extent, the same result takes place on some of the railroads in New England, where rival lines are certain to be established, whenever the business of one proves very productive.

This is not the case however on the railroads of the West, or those built on the great lines between it and the Atlantic, and particularly on the New York and Erie Railroad.

The rapid increase in the settlement of the country, the continued opening of new, and the extension of old lines of railroads, as well as that of lakes, rivers and canals, pour into the main channels an annual increase of trade, which none of them have hitherto anticipated, or have made sufficient provision to perform.

The New York Central, (as the combined lines between Albany and Buffalo are now termed) ten years ago, occupied the same position in reference to its prospective revenues, that the Erie Railroad does now. Few persons at that period would have hazarded a prediction of an increase in its business equal to that which has annually taken place since the period, when it was commonly regarded as having attained its maximum.

The country adjacent to the line of the Erie and its contributing roads and water ways, is as yet only partially developed; and the same causes which have hitherto so wonderfully increased its local receipts, must continue to operate to the same, or to a greater extent, for many successive years.

The terminus of the Road being at the largest city in the Union, will, as is the case with other roads leading therefrom, ultimately render much of the first seventy miles of the adjacent country, a series of villages and gardens, which will furnish the Road with a very large amount of travel and freight, in proportion to its area, over the three lines from Chester to Newburg, Piermont and Jersey City—an aggregate length of nearly one hundred miles of road.

The system of commuting for short distances, has been followed by the best results, on many of the Roads leading from New York, Boston, and other places, but has not yet been introduced to any extent on this Road.

The charge for commuting passengers, on the Boston roads, is from thirty dollars per annum for five miles, to ninety dollars for twenty-five miles, which is estimated to be about one cent per passenger per mile. On the Harlem, the charge for one class of passengers is from twenty-five dollars per annum for six miles, to forty dollars for eighteen to thirty miles; and for another class, thirty-five and forty-five dollars, for the distances mentioned; which is estimated to be about half-a-cent a mile, for the first class named, and two-thirds of a cent for the other. The number of annual commutors on the Boston roads is about four thousand, and on the Harlem, over thirteen hundred.

These rates would be considered very low, if it was not remembered that commuting passengers afford a regular, uniform business, for the doing of which, precise provision can be made, and that the additional business, which is always done by the same trains, is attended with a very slight addition to the expenses. The commutation is confined to the head of the family—the other members, friends, visiters, and the incidental trade, furnish a large and profitable addition to the business.

It must also be considered, that the commutation system establishes a population along the line, which will furnish a permanent source of revenue, for which there is no danger of competition, diversion, or diminution.

A.—THE CHARACTER OF THE ROAD AS CONSTRUCTED, AND ITS COST,

The aggregate amount of curvature is twenty-two thousand two hundred and fifty-two degrees, in four hundred and forty-five miles of the main track, making an average of fifty degrees per mile. Sixty-four per cent. of the whole distance is straight lines.

The annexed tables (C) show the amount of curvature and tangents, as well as the grades, arranged in classes.

The whole amount of ascents and descents is eight thousand and fifty-six feet in four hundred and forty-five miles, making an average of eighteen feet per mile.

From Almond Summit to Delaware, a distance of two hundred and fifty-six miles, the heaviest grade in the direction of the greatest trade (eastward) is only five feet per mile, except for a distance of six miles.

From Dunkirk to the summit between Lake Erie and the Allegany River, the maximum opposing grade going east is forty feet per mile, and west is thirty-five feet. Thence to Great Valley, east is forty feet, and west is thirty feet. Thence to Olean, east is fifteen feet, and west is twenty-five feet. Thence to the summit between the Allegany and Genesee Rivers, the maximum grade east is thirty-nine feet and west is thirty-five feet. Thence to Belvidere, east it is level or descending, and west is forty-nine feet. Thence to Phillipsville, east it is descending, and west is twenty-three feet. Thence to Andover, east is forty feet, and west it is level, or descending.

From Andover, to the summit between the Genesee and Canisteo, the maximum grade east is forty feet, and west it is level or descending.—Thence to Hornellsville, it is level or descending east, and west is fifty feet. From Hornellsville to Corning, the maximum grade east is level or descending, and west, is ten feet. From Corning to Susquehanna, the maximum grade east is five feet, and west it is ten feet; thence to the summit between the Susquehanna, and Delaware rivers, the grade for six miles, is ascending east sixty feet per mile, and thence to Deposit, seven miles, it descends uniformly east fifty-eight feet.

From Deposit to Delaware, the grade is level or descending east, and the maximum west is fifteen feet. From Delaware to Otisville is a uniform grade, ascending east of forty-five feet. Thence to Chester, the maximum east is fifty-six feet, and west, is sixty feet. Thence to Sufferns, the maximum east, is fifty-eight feet, and west is fifty feet.

From Sufferns to Blauveltville, the maximum grade east is fifty-nine feet, and west it is sixty feet. From Blauveltville to Pier, the grade is level or descending east, and the maximum west is fifty feet.

From Otisville to Chester, and thence by the way of the Newburg Branch, to the Hudson River, the grades east are level or descending, except nine and a half miles, and from the Almond Summit to this terminus of the road, a distance of three hundred and nine miles, the grades east are mostly level or descending, the opposing grades east, with the exception of twenty-eight miles, not exceeding a maximum of five feet to the mile.

The annexed tables (D) furnish the number and span of the Bridges and Culverts, the dimensions of the cuttings and embankments, the quantity of ballasting done, the number and dimensions of the cross-ties, chairs and spikes, and the quantity of iron rails in the main tracks and sidings.

The whole length of the main track, from the Pier to Dunkirk, is four hundred and forty-five miles, and (including the Newburg Branch of nineteen miles, and the Union Railroad to Jersey City of thirty-one and a half miles,) is four hundred and ninety-five miles.

The whole length of the second track completed and in use, is one hundred and thirty-seven and one third miles, viz:—From the Pier to Clarkstown, eight and three-fourth miles, from Sufferns to Otisville, forty-three and one-half miles, and from Susquehanna to the Junction near Elmira, eighty-five miles. It is also in progress, and will be completed in January next, from Bergen to Paterson, fourteen and one-fourth miles, from Otisville to Delaware, twelve and two-third miles, and from Deposit to Susquehanna, fifteen and a half miles, making together one hundred and eighty miles of second track, besides eighty miles of the turnouts and sidings.

Considering the several lines to the Hudson River, as equivalent to a double track, a second track will soon be in use from New York to Corning a distance of two hundred and ninety-one miles except ninety miles along the Delaware, and fourteen miles along the Chemung, the construction of which will not be required until the business of the road is largely increased.

The Cuttings for the first track, were made twenty feet wide, and for the second track, twenty-three feet.

The Embankments for the first track, were made fourteen feet, and for the second, thirteen feet wide.

The slopes in earth were made, from one and one-half to one, to two to one, and in rock, from one-fifth to one, to one-half to one.

The Ballasting has been well done, on three hundred and thirty-eight miles of the first, and one hundred and thirty-nine miles of the second track. The material used for the embankments, on the remainder of the distance, being chiefly on the Susquehanna Division was deemed sufficient without the use of ballasting. It may be advisable at some future period however, to ballast one hundred miles of this division, and about fifty miles in other places.

The Cross Ties are generally nine feet long, six inches thick, with six to eight inches face.

The number of ties laid in the track is two thousand nine hundred and thirty-four per mile. The number originally laid, was two thousand two hundred.

The longitudinal sil's, which were used on the Eastern and Delaware Divisions, have generally been removed, and substantial ties and full ballasting substituted.

The Chairs weigh twenty-five pounds each. Those on the old track weighed seventeen pounds, About four tons of spikes have been used to the mile.

The quantity of Iron Rails laid in the tracks, is nearly seventy thousand tons, making seven hundred and fifteen miles of road, including nearly eighty miles of turn-outs. The weight of the rails in the main tracks, are generally from fifty-eight to seventy pounds per lineal yard, and those in the sidings are from fifty-six to sixty pounds.

All defective and worn-out rails, have been re-

placed with new iron; so that hereafter, the annual replacement of the rails, will only be that, which is necessary to meet the usual wear. The light rails used in the old track, have generally been replaced by new and heavier ones.

The chief part of the rails which are taken out of the main track, are suitable and are required, for extending and increasing the number of the side tracks at the stations, to accommodate the annually increasing business.

The number of lineal feet of Bridging built, is twenty-five thousand three hundred and thirty-seven, of which five thousand four hundred and seventy-eight feet, are for the second track. One-half of the length, is in spans of one hundred and fifty feet and over.

The bridges have all been constructed in the most permanent manner, either originally, or by the substitution of new ones, where those first built were found to be weak or defective.

During the last year there was expended $161,-970 60 in building new bridges.

There are one hundred and fifty eight Arch, six hundred and three Box, two hundred and fifty three open stone Culverts, and three stone Viaducts, of from fifteen to thirty feet span, and one of seventeen arches of fifty-one feet span.

A number of stone culverts have been built, in place of wooden bridges during the last two years.

There are three large Machine Shops: viz: at Piermont, Susquehanna and Dunkirk, fitted up with the most complete set of tools and conveniences, for repairing and fitting up locomotives, &c., and extensive shops and buildings similarly equipped, for repairing and manufacturing cars.

There are also five smaller Machine Shops, and thirty-five Engine houses, containing in the aggregate over one hundred stalls, together with fifteen Turn-tables.

There are fourteen passenger houses and refreshment saloons, twenty-nine freight houses and forty-six station houses, used for both purposes; twelve buildings used for dwelling, offices, &c., and fifty-five smaller buildings used for various other purposes. This statement does not include the block of buildings, owned by the Company in the City of New York.

There are also twelve thousand six hundred and forty-eight lineal feet of wood houses, and a large number of water stations.

The road has been in use a sufficient length of time, to show what slopes of cuttings and fillings were required, what side ditches and other protections were necessary, to allow the embankments to become well settled, to determine the strength and stability of the bridges, and to test the strength of the iron and the quality of all the materials used.

The imperfections of original construction, have been corrected, wherever it was necessary, by the enlargement of the excavations and embankments, by the construction of bank walls, by the raising of embankments and the substitution of new structures, iron and materials, wherever those originally put in were defective or have decayed.

The road is therefore at this time, in a more perfect condition, than it has been at any previous period, and the future expenditures for these purposes, will be materially diminished.

The number of Locomotives owned by this Company, is one hundred and fifty, of which three are worn out; three are in the shops, undergoing general repairs, and twelve others, slight repairs, leaving one hundred and thirty-two in use. Of those in use, thirty-one require slight repairs, and one hundred and one are in complete order. Eight of the engines were run on the narrow gauge, between Paterson and Jersey City, and are thrown out of use by the completion of the broad gauge track, over that portion of the road.

Contracts have been made for sixty new engines which will be delivered during the ensuing six months.

The annexed tables (E) exhibit the number of engines, employed on each division of the road, the condition, the cost of the ordinary and extraordinary repairs on each engine, and the number of miles run, and the cost per mile run by each, for the last year.

The cost of ordinary repairs was $148,744 35
" " " extraord. " " 139,899 96
" number of miles run " 2,790,509
" cost of ordinary repairs per mile run was 5⅓ cents.
" " of extraordinary repairs per mile run was 5 cents.

A line of Magnetic Telegraph extends over the whole length of the main road and the Union and Newburg Branches, and also over several of the connecting roads.

The length of Telegraph line operated by this Company, is four hundred and ninety-seven miles; the number of offices is fifty-seven, and the number of Telegraph operators employed is sixty-five.

The expenditure for its construction has been $50,000, and the annual cost of maintaining and operating it is $3,000.

The cost of the road and equipment to the present date, and the expenditures thereon during the past year, are as follows:—

ONWHAT ACCOUNT.	PRESENT COST.	Expenditure during the year ending Sept. 30, 1853.
For graduation, masonry, and bridges, as follows:—		
Grading, transportation of laborers and materials, and gravel and hand-cars	$12,959,619 97	$2,261,889 43
Superstructure	2,374,186 08	451,219 07
Iron	3,764,216 03	896,860 58
Stations, buildings, and fixtures, viz:		
Freight and Passenger Depots.	513,362 87	57,887 98
Water Stations and Wood Sheds	254,941 21	66,324 91
Machine and Workshops	233,778 97	33,547 84
Machinery in Shops	161,604 78	28,241 58
Depot and Stores in N. York	92,974 01	4,029 50
Land, land damages and fences	1,159,515 16	82,149 49
Locomotives and fixtures	1,362,971 45	12,284 16
Passenger and Baggage Cars	392,659 62	59,780 84
Freight and other Cars	1,470,402 45	320,048 40
Telegraph	50,081 69	5,385 57
Duane street Pier	12,878 86	.....
Dunkirk Harbor Improvement	12,066 74	1,505 84
Steamboats and Barges on Hudson River	205,586 90	24,675 00
Office Expenses	195,996 63	24,576 24
Engineering	476,878 57	30,733 40
Agencies	148,068 00	80,381 45
Contingencies	172,325 71	93,625 50
Interest on Stock, according to terms of subscription, &c., &c.	1,651,694 13	115,254 66
Interest on first Mortgage Bonds paid to State Comptroller	499,944 17	.....
Discount on sale of Bonds	1,765,464 08	.....
Construction previous to 1845	1,361,616 13	.....
Totals	$31,222,834 21	$4,651,101 44

The old account of expenditures prior to the subscriptions received in 1845, is as follows:

State Loan released	$3,000,000 00
Forfeited Stock	65,571 29
Six per cent. Certificates	265,515 42
Seven " "	168,146 44
Drafts at pleasure	54 03
Stock surrendered	742,100 00
Bills payable	2,899 81
New Stock given for old surrendered, cash paid, and outstanding liabilities	917,600 43
Old Stock not surrendered	12,400 00
Total	$5,169,284 42
This is now represented by:	
New Stock	742,100 00
Seven per cent. Certificates	503,868 90
Old outstanding liabilities	14,214 51
Cash paid on old account	101,432 72
Total	$1,361,616 13

The expenditures which have been made during the past year, have been incurred for the following purposes:—

Advances to the Union Railroad Company, for laying down a wide track from Jersey City to Sufferns, thirty-one and a half miles, and a second track to Paterson, including turn-tables, station houses, side tracks; two extensive bridges, for a double track across the Hackensack and Passaic Rivers, with large and substantial draws; several smaller bridges and culverts; the widening of the Boiling Spring quicksand and other cuts; several other excavations; raising and widening the embankments; ballasting a considerable portion of the distance; extending and re-building the culverts, cattle guards and passes; fencing; and the purchase of additional grounds and facilities, for conducting the operations of this part of the road.

On the Eastern Division, thirty-four miles of the second track, have been completed and brought into use, ten miles more are nearly completed, and the grading and ballasting on twelve miles more, almost finished and ready for the superstructure.

On this Division there have been built and brought into use, eleven double track bridges, each of from twenty-one to one hundred and sixty-three feet span, besides six bridges, the masonry of which has been completed, and the superstructure nearly finished; and the Neversink Bridge, the masonry of which is nearly completed. There have also been built, nine arch culverts, of from six to twenty-five feet span, and a number of cattle guards, passes and road crossings.

In nearly every case, it has been necessary to build the above mentioned bridges, culvert, &c. for both tracks, as the old structures were of a temporary character.

The grading for the second track, from Otisville to Delaware, was very heavy and expensive, a considerable portion of it being heavy rock excavation.

On the Delaware Division, east of Deposit, several side tracks have been put in, and others extended, to accommodate the increased number and length of the freight trains, The excavations and embankments have been widened. The masonry for the bridge across the Delaware River, at Delaware, (required to be built as one of the conditions of the Pennsylvania charter) has been about one-third finished, and the timber for the superstructure furnished.

Between Deposit and Susquehanna, (fourteen and one-half miles) the grading for the second track has been nearly completed, the cross ties and iron delivered, and the ballasting for four miles done, ready for the superstructure.

This work has been very expensive, in consequence of the large amount of rock required to be excavated.

On the Susquehanna Division, eighty-six and three-fourth consecutive miles of the second track, have been completed and brought into use, extending to the junction with the railroad to Canan-

daigua, four miles beyond Elmira. Twenty-four new bridges for double track, of from thirty to one hundred and fifty feet span each, and nine new bridges for single track, each of from thirty to one hundred feet span, have been built, besides a large number of new culverts, sluices, cattle guards, road and bridge crossings, for the second track, and to replace the original temporary structures.

The Depot grounds have been graded for additional side tracks, and the tracks laid down, at all of the important stations, and several new turntables, track scales, and water stations have been built.

On the Western Division, the expenditure has been chiefly incurred, for grading and putting in side tracks, constructing fences, widening ditches, and ballasting the road bed, and for a new turntable, and freight and passenger house at Hornellsville.

The rapid accumulation of business on the eastern end of the road, rendered the construction of a second track necessary, almost simultaneously, with the extension of the first track to the Lake.

By the opening of the next season, a second track will be in use, equivalent to one half of the length of the road.

A continuance of the present ratio of increase, in the business of the road, will require additional track facilities, from time to time, and for this purpose, it is intended to construct additional and longer turn-outs, on the Delaware Division, and at some other places, where they will ultimately form portions of the second track.

With these additions, the road will be capable of performing a business, which will yield an annual revenue, of from seven to eight millions of dollars.

All the great lines of railroads in this country, have been subjected to extra expenses, arising from the graduni improvements, which they have been compelled to introduce in the superstructure and equipment of the roads, and also from the want of sufficient capital, which rendered it necessary to obtain money, by the sale of stock and securities, below their par value.

The earlier built roads, have been subjected to more of the extra expense, arising from the first cause stated, than those of recent construction.

To be continued.

Pacific Railroad.

The Secretary of War, in his recent report, devotes a portion of the document to a consideration of the subject of a railroad to the Pacific. So much as relates to the topography of the country, and the measures now in progress, for more full and perfect explanations of the region to be traversed are given below.

The western portion of the continent of North America, irrespective of the mountains, is traversed from north to south by a broad, elevated swell, or plateau of land, which occupies the greater portion of the whole space between the Mississippi river and the Pacific ocean. The crest of this plateau, or the watershed of the country, is nearly midway between the Pacific coast and the Mississippi. It may be represented on the map by an undulating line, traced between the head waters of the streams which flow eastward and those which flow westward. It divides the whole area between the Mississippi and the Pacific into two nearly equal portions, that on the east being somewhat the larger. This crest of the watershed has its greatest elevation in Mexico, and thence declines to its lowest point about the latitude of 31, where it has a height of about 4500 feet, between the waters of the Rio Grande and those of the San Pedro, a tributary of the Gila. From this parallel it increases in latitude northward, and reaches its maximum near to the thirty-eighth parallel, where it is about 8,000 feet high. Thence it declines as we pass northward, and in latitude 42 24 has an elevation of say 7,000 feet, and in the latitude of about 47 deg., it is reported to be at least 1,000 feet lower. The heights here given are those of the lowest passes over the crest, or watershed, of the great plateau of the country, and not those of the mountain peaks and ridges which have their base upon it, and rise, in some cases, to the height of 17,000 feet, into the region of perpetual snow.

The slope of the plateau on the east and south, towards the Mississippi and the Gulf of Mexico, is comparatively gentle, and in Texas is by several steps, of which the highest is that known by the name of "Llano Estracado," or Staked Plain. It is traversed by the Missouri, the Platte, the Arkansas, and other large rivers, which rise among the mountains near the crest, and flow eastward and southward, in channels sunk beneath the general surface level of the plains.

In latitude 42 deg., near the source of the Platte, it has an elevation of about 5,000 feet above tide, and in the same latitude on the Mississippi about 1,000 feet. Towards the sources of the Arkansas. in latitude 36 deg., it has a height of 4,000 feet, and in the same latitude on the Mississippi 275 feet. These elevations give an average declination eastward, to the whole plain, of about 4½ feet per mile, and southward of about 2½ feet

The coast of the plateau, and nearly the whole of its western portion to the Pacific, is occupied by a great mountain system, the continuation of the Andes of South America. It has a variable bredth, narrowest within our possessions near the Gila, in latitude 32 degrees, where it has a width of about 500 miles, and attains its greatest expansion in the parallel of 43 degres, where it occupies a space of about 900 miles. On this mountain base, as has been said before, are situated a series of elevated peaks, ridges, and ranges. Those on the eastern side are nearly continuous for about 900 miles, and known by the name of the Rocky Mountains; those on the western side are, perhaps, less continuous, although equally elevated above the base, and designated as the Sierra Nevada, Coast Range, Cascade Mountains, etc. The whole space between these extreme ranges is occupied by high peaks, and in various directions by a series of ridges, including elevated valleys, and forming great basins, having no outlet to the sea. The most important of these is Salt Lake Basin, having an elevation of 4,100 feet.

This mountain region is not, as is frequently supposed, a single chain, but a system, extending from a little east of the crest of the watershed to near the shores of the Pacific, and occupying about one-half of all the space between the Mississippi and the Pacific ocean. The position of this belt of mountain region, stretching from north to south, gives rise to a peculiarty of climate and soil. Fertility depends principally upon the degree of temperature and the amount of moisture, both of which are much effected by increase of elevation, and the latter also depends on the direction of the wind. The upper or return current of the trade wind, flowing backwards towards the northeast, gives a prevalence of westerly winds in the north tempe: ate zone, which tends to spread the moisture from the Pacific over the western portion of our continent.

These winds, however, ascending the western slope of the mountain ridges, are deprived of their moisture by the dimiuished temperature of the increased elevation, and hence it is that the plains and valleys on the eastern sides of the ridges are generally parched and barren, and that th mountain system, the highest chain of which is known as the Rocky Mountains, by presenting, as it were, a screen against the moisture with which the winds of the west come laden—has for its eastern margin a sterile belt, which probably extends along the whole range, with an average width of about 250 miles.

These general views, derived as they have been from imperfect data, may yet serve to give some idea of the immense magnitude of the work necessary to construct a railway from the Atlantic to the Pacific.

No work for artificial communication has ever exceeded it in extent and physical difficulty. Its execution, however, is within the means and power of the American people. The degree of practicability and the comparative economy and eligibility of routes cannot be determined without accurate instrumental surveys. An error in the selection of the route may involve the undue expenditure of many millions, and the ultimate value of the work; for this choice should not depend alone upon the apparent ease of construction, but also upon the productive character and general resources of the country through which it passes.

From the foregoing sketch, it will be perceived that the lines of exploration must traverse three different divisions or regions of country, lying parallel to each other, and extending north and south, through the whole of the western possessions of the United States. The first is that of the country between the Mississippi and the eastern edge of the sterile belt, having a varying width of from five hundred to six hundred miles; the second is the sterile region, varying in width from two hundred and fifty to three hundred miles, and the third the mountain region, having bredth of from five to nine hundred miles.

Explorations show that the surface of the first division, with few exceptions, falls in gentle slopes from its western boundary to the Mississippi, at the rate of about six feet to the mile, and that it offers no material obstacle to the construction of a railway. It is, therefore, west of this that the difficulties are to be overcome. The concurring testimony of reliable observers proves the second division, or that called the sterile region, to be so inferior in vegetation and character of soil that it has received, and probably deserves, the name of the desert. The construction of a railway through this region will be attended with obstacles which, though not insurmountable, will be scarcely less diffiicult to overcome than the elevations in the mountain Passes in the next division.

Report also gives the character of extreme sterility to much of the country embraced in the monntain region; yet in the conflict of opinion on this subject, and amid the variety of accounts which have been given of it, doubts have arisen in the minds of many as to the possibility of existence of such extensive regions within our possessions, unsuited to the purposes of man. To settle this question, with which the construction of a railway is intimately connected, the parties have been instructed to collect all the facts which may have a bearing on the capacity of these regions to support human life.

It was necessary, before determining what routes should be explored, to examine the information which had already been obtained. Only three parties had extended their explorations with proper instruments from the Mississippi to the Pacific.—The first and most northern, was by the way of what is called the South Pass and the Sierra Nevada; the second from Santa Fe, the Copper Mines, and along the Gila, and the third by the way of the Zuni river and the Colorado.

Other surveys have been made with barometer levels over the detached portions of the region to be explored. The information thus obtained, though limited, is specific as far as it goes, and gives just ideas of the elevations and obstacles to be surmounted. Much valuable and reliable information has also be furnished by the Mexican Boundary Survey.

The explorations of Lewis and Clarke, who crossed to the Pacific, and those of Col. Long, while they throw much light on the general geography and topography of the country, and have served to indicate the routes to be explored, do not give profiles of the regions passed over.

Reports from travellers who have gone over the continent entirely without insruments, are as various and conflicting as the routes themselves, and even of the same totally different accounts are given. Any information other than that based on accurate instrumental measurement, though it may be of some importance in indicating routes to be surveyed, is of little value in determining the question of a railway. It is necessary for this

purpose to have well determined facts, and not vague impressions.

The expedition of Lewis and Clarke showed the probability of a considerable indentation in the crest of the water shed of the continent, near the forty-seventh parrallel of north latitude, and indicated the probability of a railway route in this region, from the head waters of the tributaries of the Missouri, across to those of Clarke's river.

The party first organized under the act of Congress was the one to explore this line, which claimed the earliest attention from the known severity and length of the winter, and the necessity of commencing operations early in the year. It was placed in charge of Governor Stevens, of Washington territory, who was directed to operate from St. Paul's or some eligible point on the Upper Mississippi, towards the great bend of the Missouri river, and thence on the table land between the tributaries of the Missouri and those of the Laskatshawan to some eligible pass in the Rocky Mountains. A second party, commanded by Captain McClellan, under the direction of Governor Stevens, was directed to proceed at once to Puget Sound, and explore the passes of the Cascade range, meeting the eastern party between that range and the Rocky Mountains.

Taken in geographical order, the next survey ordered to be made was that entrusted to Capt. Gunnison, corps of of Topographical Engineers.—He was instructed to explore the route near the 38th parallel of latitude, by the Huerfano river and Coocho-to-da, or some other eligible pass, into the mountainous region of the Grand and Green rivers, and westwardly to the Vegas of Santa Clara and Nicollet's river of the Great Basin, and thence northward to the vicinity of Lake Utah. Reliable information furnished by persons who had been extensively connected with the western explorations of the government, gave such assurance that no railway pass could be found north of Kern river into either the Sacramento or San Joaquin valley, that it was not deemed proper to expend any part of the limited means appropiated in such a search; and having learned that the Mormons of the Great Salt Lake were making a survey for a railroad from their settlement to Walker's Pass, Capt. Gunnison, whose former intercourse with their engineer would enable him to obtain whatever information he possessed, was directed to procure a report of that survey, thus connecting his line with the survey to be ordered near the 35th parallel.

Postponing for future operations, if further surveys shall be ordered, the exploration of a route from the Salt Lake across the Sierra Nevada to the valley of the Sacramento, Capt. Gunnison was directed to return from the Great Basin through the Timpanajo Canon or other passes, and across the Weber and Bear rivers by the coal basin, to such point of disbandment as his discretion might direct.

The next line is that near the thirty-fifth parallel, which is in charge of Lieut. Whipple, of the corps of topographical engineers. He was directed to ascend the valley of the Canadian river, to pass around the mountains of east Rio del Norte, and enter the valley of that river at some point near Alburqueque, thence to extend his explorations west through Sierra Madre and the mountains west of Zuni and Moqui countries to the Colorado of the West, and proceeding in the direction of Walker's Pass, to continue his survey by the most direct and practicable line to the Pacific ocean.—Much testimony in favor of the practicability of this line indicated it as a proper route for exploration.

Another line further South is that suggested by the surveys of Major Emory in 1846, and those of the boundary line of the 32d parallel. It passes around the extremity of the Gaudalupe mountains of Texas in about latitude 31 deg., and crosses the Rio Grande near Dona Ana, or Frontera, in about latitude 32 deg., and thence follows the table lands west of the San Pedro river, and thence along the Gila river to its mouth. A portion of this line passes through the territory of Mexico, and another portion is north of the line of operations of the boundary commission, and, consequently, these were not included in the boundary survey. The gaps thus existing in this line are to be filled up by the survey of Captain Pope, and that under the direction of Lieutenant Parke, both of the corps of Topographical Engineers. The instructions to the latter were not given until recently, because the survey with which he is charged requires a part of the line to be run within the limits of Mexico. The Mexican government, have, however, removed the difficulty by granting authority to the United States to make explorations necessary to determine the practicability of a railway route in this region.

Several partial routes on the Pacific side, to connect as before described with those from the east, were directed to be surveyed by Lieut. Williamson, of the corps of Topographical Engineers. He was instructed to examine all the passes eastward from the valley of San Joaquin and the Tulare lakes, and subsequently to explore Walker's and other passes which exist in the high range of mountains apparently the southern continuation of the Sierra Nevada.

The experience of almost every party which has crossed the continent shows the necessity of fitting out a separate party on the shores of the Pacific to explore the Sierra Nevada and other elevated ranges near that coast. Parties reaching these great barriers from the Atlantic side are too much fatigued and exhausted to make elaborate surveys. It is also necessary that these parties should commence operations early in the spring, in order to complete the field work before the heavy snows interrupt progress.

Copies of the instructions given to all the parties are hereto appended. From these it will appear that the officers of the different expeditions have been directed to observe and note all the objects and phenomena which have an immediate or a remote bearing upon the railway, or which may serve to develop the resources, peculiarities and climate of the country. For this purpose they have been supplied with full sets of instruments for determining the latitude and longitude of places, the courses and distances of the routes, and of the topography of the country on either side within accessible distances; with the means of ascertaining the variation of atmospheric pressure and other meteorological phenomena; and two of the parties with instruments to determine the direction and intensity of the magnetic force. They have been directed to observe the prevailing direction of the wind, the amount of rain, the degree of temperature and humidity of the atmosphere; they are also required to report on the geology of the country, to gather specimens of the different rocks and soils, to make collections of the plants and animals, and to collect statistics of the Indian tribes which are found in the regions traversed.

The information which may be derived from this series of observations will be of much value in establishing the capacity of the country to sustain population and furnish articles of commerce. The astronomical observations are indispensable in fixing the geographical position of the principal points of the route, and for improving the map of our Western possesssons. The magnetic observations are of importance in accurately tracing the line between the points determined by astronomical observation. It is well known that the magnetic needle has an irregular and sometimes fitful variation, amounting to a difference of eighteen degrees between Washington city and the Western coast of Oregon, and the law by which this variation is increased or diminished has not been ascertained.

The meteorology of the country has a direct bearing on the question of the construction of a railway. The amount of snow which will probably be found along the route should be ascertained and this will depend on the temperature and humidity of the place. As we advance to the north the amount of vapor diminishes, and hence the quantity of snow which falls will be less; but, on the other hand, it will lie longer, on account of the diminution of temperature. It was, therefore, deemed proper that the hygrometrical state of the atmosphere should be measured by suitable instruments, and the mean temperature ascertained by thermometrical observations of the soil at a few feet below the surface.

A knowledge of the geology of the country is important, as affording essential data relative to the construction and use of the railway. It teaches, in advance of our expensive experience, the obstacles which will be presented by rocks to be excavated, and their fitness for use in masonry, and discloses the presence of sand, which may drift over the track or damage the rubbing parts of the machinery. From the character of the geological formation is to be inferred the probability of the existence of coal, and from the dip and strata of the rock, the feasibility of procuring water by Artesian wells, for the use of the engines—and whether or not the supply may be extended beyond this want, and happily serve for irrigation of the land. Should this last result be obtained, it would furnish the means to convert a sterile waste into a fertile region, and add to the power and wealth of the United States, by extending their settlements in a continuous chain from sea to sea.

There is but little doubt, that the best line which can be chosen will present a combination of nearly all the obstacles which have, up to this time, been successfully encountered by the art of the engineer, and that any haste or negligence which should cause an improper location of the road to be made, must lead to consequences which would endanger the success of the whole enterprise.

A striking illustration of the value of opinion not based on instrumental survey is presented in the developements made by Lieutenant Williamson's exploration of Walker's Pass. It will be remembered that this famous gap was considered a fixed point, and the various expectations on routes differing in everything else, generally concurred in tending to Walker's Pass. Recent information from Lieutenant Williamson establishes the fact that this pass is impracticable for a railway.

The necessity for more rapid sources of communication has been referred to in the other parts of this report, when treating of the defence of our southern boundary, the western territory and the Pacific coast. Duties and interests of vital importance, other than these, arise in the consideration of the railroad to the Pacific; but as they do not fall under the charge of this department, I have not attempted to present claims, nor have I deemed it proper in this communication to offer my views as to the means or the mode by which the general government may constitutionally aid in the attainment of the contemplated object.

Mr. Bartlett of the Mexican Boundary Commission has written a letter, addressed to the Pacific Railroad Company of this State, we believe, in which he gives a description of the country to be traversed by the proposed road, similar to that of the Secretary of War. He inclines to the opinion that the *topography* of the country presents no insurmountable obstacle to a railroad, but states that the great belt of table lands of some five or six hundred miles in extent, is without wood or water, and much of it without grass. He might have also added, without *coal*. We shall give Mr. Bartlett's letter as soon as we can find room. It certainly becomes an important question, whether a road can be built and operated for such a distance without an abundant supply to the two prime elements in locomotion, *fuel* and *water*. While all the world are talking, will not some practical man undertake to solve this problem, which we confess, is beyond our capacity.

American Railroad Journal.

Saturday, January 7, 1854.

The length of several of the articles in the present issue excludes a number of articles of a statiscical character, appropriate to the commencement of the year, which will appear in our next number.

Railroads in the United States Jan. 1--1854.

We give below our usual tabular statement, by which it will be seen that the whole number of miles of railroad in the United States, in *operation*, upon the first day of the current year, was 15,511 miles; an increase of 2194 miles since January 1, 1853.

The condition of the money market for the first part of the year favored the progress of new enterprizes. Later in the season it has been decidedly unfavorable. Money is not readily had for the most promising of our new lines, while those of the *second* class have had great difficulty in raising sufficient sums to carry forward their works.

The unfavorable change alluded to has not grown so much out of distrust felt toward railway investments, as out of causes which have operated throughout the commercial world, and which have everywhere exerted a tendency to limit operations of all kinds to the ordinary demands of business. Our roads in operation have been eminently successful, and have earned a larger percentage upon their cost than for any previous year. Their success in this respect has exerted a strong influence in sustaining confidence in this kind of property, notwithstanding the general indisposition to embark in new schemes.

We have, from its commencement, regarded the present stringency in the money market, and its natural results, as most fortunate. Our people, within the last five years, have opened more than 10,000 miles of railroad. The success which has attended their construction, and their influence in promoting the social comfort, and in advancing the material good of our people, were so marked as to create an ardent desire for their construction in many parts of the country quite unable to furnish the necessary amount of business for their support. With such a feeling, a state of things which should create a pause, and postpone the commencement of new works, no matter how caused, could not fail to be most beneficial. While railroads are peculiarly adapted to the wants of this country, and while their success is the necessary result of such adaptation, there can be no doubt that we may be in great danger of *over-doing* their construction. It must be remembered that our experience in these works is in its infancy, that we have not yet sufficiently ascertained the relation which the cost of their construction and operation bears to the business of a given area of territory, or number of people,

Railway Share List,

Compiled from the latest returns—corrected every Wednesday—on a par valuation of $100.

NAME OF COMPANY.		Miles open.	Capital paid in.	Funded debt.	Tot. cost of road and equipm't.	Gross Earnings for last official year.	Net Earnings for last official yr.	Dividend for do.	Price of Shares.
Atlantic and St. Lawrence...	Maine.	150	1,538,100	2,973,700	5,150,278	254,743	113,520	none	80
Androscoggin and Kennebec..	"	55	809,878	1,016,500	2,064,458	140,561	80,053	none	30
Kennebec and Portland.....	"	72	952,621	29[illegible],80	2,514,067	168,114	100,552	none	41
Port., Saco and Portsmouth..	"	51	1,355,500	123,884	1,459,384	208,669	.....	6	97
York and Cumberland,.....	"	20	285,747	341,100	713,605	23,946	11,256	none	24
Boston, Concord and Montreal.	N. H.	93	1,649,278	622,200	2,540,217	150,538	79,659	none	35
Concord	"	35	1,485,000	none.	1,485,000	305,805	141,836	8	103½
Cheshire	"	54	2,078,625	720,900	3,002,094	287,768	55,266	5	38
Northern	"	82	3,016,634	.....	.....	328,782	163,075	5	51½
Manchester and Lawrence....	"	24	717,543	.....	.....	.....	.....	6	89
Nashua and Lowell.....	"	15	600,000	none.	651,214	132,545	51,513	8	106
Portsmouth and Concord....	"	47	.....	.....	1,400,000	.....	.....	none	....
Sullivan.....	"	26	.....	.....	673,500	.....	.....	none	21
Connecticut and Passumpsic..	Vt.	61	1,097,600	550,000	1,745,516	.....	.....	none	33
Rutland	"	120	2,486,000	2,429,100	5,577,467	495,397	266,539	none	20
Vermont Central.....	"	117	8,500,000	3,500,000	12,000,000	.....	.....	....	13½
Vermont and Canada.....	"	47	1,500,000	.....	1,500,000	Leased to	the Vt. C	ent.	98
Western Vermont.....	"	51	392,000	700,000	.....	Recently	opened.	none	....
Vermont Valley	"	24	.....	.....	.....	.....	.....	none	....
Boston and Lowell.....	Mass.	28	1,830,000	.....	1,995,249	388,108	130,881	7	93
Boston and Maine.....	"	83	4,076,974	150,000	4,092,927	659,001	338,215	7	102
Boston and Providence.....	"	53	3,160,390	390,000	3,546,214	469,656	227,434	6	85
Boston and Worcester.....	"	69	4,500,000	425,000	4,845,967	758,819	331,296	7	100
Cape Cod branch.....	"	28	421,295	171,800	633,906	60,743	30,056	2	40
Connecticut River.....	"	52	1,591,100	193,500	1,801,946	229,004	72,028	5	55
Eastern.....	"	75	2,850,000	500,000	3,120,391	488,793	241,017	7	88
Fall River.....	"	42	1,050,000	none.	1,050,000	229,445	99,589	8	100
Fitchburg.....	"	66	3,540,000	112,305	3,623,073	574,574	232,787	6	93½
New Bedford and Taunton...	"	20	500,000	none.	520,475	164,230	43,950	7	117
Norfolk County.....	"	26	547,015	819,743	1,245,927	67,251	23,415	none	60
Old Colony.....	"	45	1,964,070	282,300	2,293,534	322,213	101,510	none	91
Taunton Branch.....	"	12	250,000	none.	307,136	137,406	24,399	8	....
Vermont and Massachusetts..	"	77	2,140,536	1,001,500	3,203,333	218,679	18,648	none	13½
Worcester and Nashua.....	"	45	1,134,000	171,210	1,321,945	162,109	66,900	4	58
Western	"	155	5,150,000	5,319,520	9,953,759	1,339,873	683,194	6	97
Stonington.....	R. I.	50	.....	467,700	.....	240,572	110,892	....	66
Providence and Worcester...	"	40	1,457,500	300,000	1,731,498	253,690	139,514	6	95
Canal.....	Conn.	45	922,500	500,000	1,400,000	.....	.....	4	65
Hartford and New Haven....	"	72	2,350,000	800,000	3,150,000	639,529	294,269	10	123
Housatonic.....	"	110	.....	.....	2,500,000	329,041	168,902	none	....
Hartford, Prov. and Fishkill..	"	50	.....	.....	In progres	69,629	.....	none	....
New London, Wil. and Palmer	"	66	558,861	800,000	1,511,111	114,410	.....	....	39
New York and New Haven...	"	61	3,000,000	1,641,000	4,978,487	806,713	428,173	7	101½
Naugatuck	"	62	926,000	440,000	.....	.....	.....	8	....
New London and New Haven.	"	55	750,500	650,000	1,380,610	Recently	opened.	none	52
Norwich and Worcester.....	"	54	2,121,110	701,600	2,596,488	267,561	116,965	4	58½
Buffalo and New York City..	N. Y.	91	900,000	1,550,000	2,550,500	Recently	opened.	none	85
Buffalo, Corning and N. York.	"	132	.....	.....	In progres	.....	.....	none	65
Buffalo and State Line.....	"	69	879,636	872,000	1,921,270	Recently	opened.	....	130
Canandaigua and Niagara F..	"	50	.....	.....	In progres	.....	.....	....	....
Canandaigua and Elmira.....	"	47	425,509	582,400	987,627	76,760	39,360	none	68
Cayuga and Susquehanna....	"	35	687,000	400,000	1,070,786	74,241	23,496	none	....
Erie, (New York and Erie)...	"	464	10,000,000	24,003,865	33,070,863	3,537,766	1,691,623	7	79½
Hudson River.....	"	144	3,740,515	7,046,395	10,527,654	1,063,659	338,783	none	68
Harlem	"	130	4,725,250	977,463	6,102,935	681,445	324,494	5	56
Long Island.....	"	95	1,875,148	516,246	2,446,391	205,068	44,070	none	30
New York Central	"	504	23,085,600	10,773,823	33,859,423	.....	.....	....	114
Ogdensburgh (Northern).....	"	118	1,579,969	2,969,760	5,133,834	480,137	195,847	none	30
Oswego and Syracuse.....	"	35	350,000	201,500	607,803	90,616	43,609	4	70
Plattsburg and Montreal....	"	23	174,042	131,000	349,775	Recently	opened.	none	....
Rensselaer and Saratoga....	"	25	610,000	25,000	774,495	213,078	96,737	....	....
Rutland and Washington.....	"	60	850,000	400,000	1,250,000	Recently	opened.	....	....
Saratoga and Washington....	"	41	899,800	940,000	1,832,945	173,545	135,017	none	30
Troy and Rutland.....	"	32	237,690	100,000	329,577	Recently	opened.	....	33
Troy and Boston.....	"	39	430,936	700,000	1,043,357	Recently	opened.	none	....
Watertown and Rome.....	"	96	1,011,940	650,000	1,693,711	225,152	116,706	8	92
Camden and Amboy.....	N. J.	65	1,500,000	.....	4,327,499	1,888,385	478,413	10	145
Morris and Essex.....	"	45	1,022,420	128,000	1,220,325	149,941	79,252	7	....
New Jersey.....	"	31	2,197,840	476,000	3,245,720	603,942	316,259	10	131
New Jersey Central.....	"	63	986,106	1,500,000	2,379,880	260,899	124,740	3	....
Cumberland Valley.....	Penn.	56	1,184,500	13,000	1,265,143	118,617	76,890	5	....
Erie and North East.....	"	20	600,000	.....	750,000	Recently	opened.	....	125
Harrisburgh and Lancaster...	"	86	830,100	713,227	1,702,523	265,827	106,320	8	52
Philadelphia and Reading....	"	95	6,656,832	10,427,800	17,141,987	2,480,626	1,251,987	7	79
Philad., Wilmington and Balt.	"	98	3,850,000	2,408,276	6,818,889	667,785	388,501	5	80

Railway Share List,

Compiled from the latest returns—corrected every Wednesday—on a par valuation of $100.

NAME OF COMPANY.		Miles open.	Capital paid in.	Funded debt.	Tot. cost of road and equipm't.	Gross Earnings for last official year.	Net earnings for last official yr.	Dividend for do.	Price of shares.
Pennsylvania Central	Penn.	250	9,768,155	5,000,000	13,600,000	1,943,827	617,625	....	94
Philadelphia and Trenton	"	30	....	....	....	....	....	....	....
Pennsylvania Coal Co	"	47	....	....	....	....	....	....	102½
Baltimore and Ohio	Md.	381	9,188,300	9,827,123	19,542,307	1,825,563	615,384	7	57½
Washington branch	"	38	1,650,000	....	1,650,000	348,622	216,237	8	....
Baltimore and Susquehanna	"	57	....	....	....	413,673	152,536	....	..
Alexandria and Orange	Va.	65	....	....	In prog.	....	....	....	....
Manassas Gap	"	27	....	....	In prog.	....	....	....	....
Petersburgh	"	64	769,000	173,867	1,163,928	227,593	72,370	7	77
Richmond and Danville	"	73	1,372,324	200,000	In prog.	....	....	....	70
Richmond and Petersburgh	"	22	685,000	....	1,100,000	122,861	74,113	none	40
Rich., Fred. and Potomac	"	76	1,000,000	503,006	1,531,238	254,376	113,256	7	100
South Side	"	62	1,357,778	640,000	2,106,467	62,762	....	....	....
Virginia Central	"	107	1,400,100	446,036	In prog.	176,485	74,902	none	61
Virginia and Tennessee	"	60	3,000,000	1,500,000	In prog.	....	....	none	98
Winchester and Potomac	"	32	180,000	120,000	416,532	89,776	....	12	....
Wilmington and Raleigh	N .C.	161	1,338,878	1,134,698	2,965,574	510,038	153,898	6	....
Charlotte and South Carolina	S. C.	110	....	....	....	....	....	....	....
Greenville and Columbia	"	140	1,004,231	300,000	In prog.	....	....	....	....
South Carolina	"	242	3,858,840	3,000,000	7,002,396	1,000,717	609,711	7	125
Wilmington and Manchester	"	....	....	....	In prog.	....	....	....	....
Georgia Central	Ga.	191	3,100,000	306,187	3,378,132	945,508	508,625	8	115
Georgia	"	211	4,000,000	1,214	....	934,424	456,468	7½	....
Macon and Western	"	101	1,214,283	168,000	1,596,283	296,584	153,697	9	100
Muscogee	"	71	....	....	In prog.	....	....	....	....
South Western	"	50	586,887	150,000	743,525	129,395	71,535	8	....
Alabama and Tennessee River	Ala.	55	....	....	In prog.	....	....	....	....
Memphis and Charleston	"	93	776,259	400,000	In prog.	....	....	....	....
Mobile and Ohio	"	33	879,868	....	In prog.	....	....	....	....
Montgomery and West Point	"	88	688,611	....	1,330,960	173,542	76,079	8	....
Southern	Miss.	60	....	....	....	....	....	....	....
East Tennessee and Georgia	Tenn.	80	835,000	541,000	In prog.	....	....	....	....
Nashville and Chattanooga	"	125	2,093,814	850,000	In prog.	....	....	....	....
Covington and Lexington	Ky.	38	1,430,150	900,000	In prog.	....	....	....	70
Frankfort and Lexington	"	29	357,218	....	584,902	87,421	44,250	....	80
Louisville and Frankfort	"	65	....	....	....	....	....	....	....
Maysville and Lexington	"	....	....	....	In prog.	....	....	....	....
Cleveland and Pittsburgh	Ohio.	100	1,239,450	1,371,000	2,963,756	194,429	123,306	6	93
Cleveland and Toledo	"	147	552,000	800,000	1,317,140	....	....	....	92½
Cleveland, and Erie	"	95	....	....	....	....	....	....	....
Cleveland and Columbus	"	135	3,027,000	408,200	3,655,000	777,793	483,454	12	124
Columbus, Piqua and Indiana	"	46	....	....	2,000,000	....	....	....	80
Columbus and Lake Erie	"	61	....	....	....	....	....	....	....
Cincinnati., Ham. and Dayton	"	60	2,100,000	500,000	2,659,653	321,793	200,967	....	106
Cincinnati and Marietta	"	....	....	....	In prog.	....	....	....	72
Dayton and Western	"	40	310,000	550,000	925,000	Recently	opened.	....	80
Dayton and Michigan	"	20	....	....	In prog.	....	....	....	....
Eaton and Hamilton	"	36	....	....	....	....	....	....	60
Greenville and Miami	"	31	....	....	....	....	....	....	....
Hillsboro	"	37	....	....	In prog.	....	....	....	....
Little Miami	"	84	2,370,784	....	2,634,157	526,746	314,670	10	113
Mansfield and Sandusky	"	....	900,000	1,000,000	1,855,000	....	....	....	....
Mad River and Lake Erie	"	167	2,387,200	1,767,000	4,110,148	540,518	113,401	....	95
Ohio Central	"	57	....	....	In prog.	....	....	....	90
Ohio and Mississippi	"	....	....	....	"	....	....	....	87
Ohio and Pennsylvania	"	187	1,750,700	2,450,000	....	Recently	opened.	....	....
Ohio and Indiana	"	....	....	....	In prog.	....	....	....	....
Scioto and Hocking Valley	"	....	....	....	"	....	....	....	....
Xenia and Columbus	"	54	1,092,137	119,500	1,257,714	Recently	135,363	15	116
Evansville and Illinois	Ind.	31	....	....	In prog.	237,506	....	....	....
Indiana Central	"	....	....	....	"	....	....	....	90
Indiana Northern	"	131	....	....	"	....	opened.	....	115
Indianapolis and Bellefontaine	"	83	....	....	"	Recently	....	....	166
Lawrenceburg and Ind	"	90	....	....	In prog.	....	....	....	77
Lafayette and Indianapolis	"	62	....	....	....	....	opened.	....	82
Madison and Indianapolis	"	88	1,650,000	750,000	2,400,000	516,414	268,075	10	70
Peru and Indianapolis	"	40	....	....	In prog.	....	....	....	65
Terre Haute and Indianapolis	"	72	632,387	663,100	1,353,019	105,944	71,446	4	108
Rock Island and Chicago	Ill.	....	....	....	....	....	....	....	....
Chicago and Mississippi	"	135	2,400,000	4,000,000	4,600,000	....	....	....	....
Illinois Central	"	....	....	....	....	....	....	....	136
Galena and Chicago	"	92	1,932,361	500,000	In prog.	473,548	286,152	....	122
Michigan Southern	Mich.	315	2,800,000	2,629,000	6,430,246	592,187	293,046	....	126
Michigan Central	"	282	4,000,000	4,067,396	8,614,193	....	....	8	101
Pacific	Mo.	38	1,000,000	none.	In progress	Recently	opened.	....	....

to be able to decide with certainty in all cases, where they are warranted. It is therefore the dictate of prudence, after having pushed their construction for several years uninteruptedly, without reference to any general system, and probably without any considerable degree of forecast, to pause and see how the end will justify expectation, or what has been already effected.

The experience of every day is showing that railroads, even in this country, cost much more than has been supposed. A *first* class *eastern* road, with a double track, cannot be built for less than $50,000 per mile, while the cost of a majority of such, exceeds this sum.

The business of a particular district may justify the construction of a road costing $20,000 per mile, while it would not one costing $40,000 per mile. In many cases it may be well to wait to see what is to be the ultimate cost of our roads in particular districts, before rushing wildly into their construction. We regard it a great misfortune that any railroad should be built that does not promise to pay a fair return upon its *cost*. The supposed *incidental* advantages should exert only a limited influence upon the question. The probability that a proposed road will *not* pay, should be taken as a conclusive reason against the scheme.

A state of things therefore which has a tendency to postpone the construction of new works, till we see what is to be the result with those already constructed, and give us the benefit of our own experience as guides to the future. We, of course, refer particularly to works of a *rival* character; works which must divide a business already accommodated to a greater or less extent by roads in operation. There is, however, a vast unoccupied field to which the above remarks will not apply. But to the New England States, to New York, Ohio, Indiana and Northern Illinois, they are practicably applicable. In portions of all these States the construction of railroads, either has been, or is threatened to be, carried to excess, and the present tightness in the money market is probably the only thing that could have saved us from some disastrous consequences.

We do not mean to be understood that even in the States named, new roads are not called for, and whose construction would contribute largely to the general good. The field for enterprize in these may not by any means be exhausted. It should, however, be cultivated with the utmost care. In other portions of the country, the reasons for caution which we have enumerated, do not exist. If 4000 miles of railroad already constructed in New York and Ohio, find profitable employment, there is no reason why 2000 miles should not in Kentucky and Tennessee, in which there are only 3 or 400 now in operation. The same remarks may have a much more extended application. Large portions of the country capable to supply a lucrative traffic to a railroad are entirely without such works. For the purpose of illustrating this portion of our remarks, we have added a statement which will show the proportion of the number of miles of railroad in each State, to its area and population. This statement will show the field to which new effort should be directed, as well as that in which the construction of these works may be carried to the greatest extent.

The number of miles of railroad, however, ne-

cessary for the accommodation of a particular district cannot be determined from its *area*. Certain portions of the country, the State of Ohio for instance necessarily becomes the thoroughfare for all the territory lying to the East and West. This State would consequently very probably sustain twice as many miles of railroad as Kentucky, though the latter State has an equal area. We throw in this remark by way of showing the necessity, on the part of persons purchasing, or negotiating railroad securities, of a *thorough* knowledge of the resources of the country, the tendencies of commerce and travel, and the relations that particular lines sustain to the general railway system of the country.

In this connection we again take occasion to insist that communities immediately interested in a road should furnish a considerable portion of the means required for construction. The laboring oar, and the risks, should in all instances be thrown upon such communities. There is a greater necessity for a strict adherance to this rule, than at any former period. Experience has rendered us skillful in substituting *shams* for substance, and of making a tolerably good looking *basis* out of fictions; stock taken by contractors, &c, &c., all of which matters should be thoroughly scrutinized. Where contracts for construction are made in *gross*, the *terms* of the contract should always be looked after by the parties purchasing securities. So long as one-half the cost of our roads are furnished by *local* cash stock subscriptions, we shall be in no danger of over-doing the construction of railroads for a long time to come. This fact is *better* evidence that the road is wanted, that it will pay well, and be managed well, than all the fine spun arguments of interested parties.

The result so far shows that railroads may be ranked as among our most profitable enterprizes For foreigners we cannot conceive a more inviting security than a first class 7 per cent. mortgage railroad bond. Where a road cost $40,000 per mile, there can be no risk in taking a mortgage upon it to one half that amount. The security of the holders of *first* mortgage bonds is being constantly increased by the increased cost of our roads. The aggregate earnings upon the entire railroad investment in the United States, in *completed* lines, will we think equal 7 per cent. This fact of itself establishes a *rule* in favor of the safety of railroad investments, and that losses, so far as the holders of the obligations of the companies are concerned, are *exceptions* to the rule, as are losses attendant upon every legitimate business. The fault may not be in the principle, but in its *misapplication*.

So long as we felt that the public did not fully appreciate the importance of railroads to the general interests of the country, or their value as investments of capital, our Journal was chiefly devoted to the elucidation of these points. The public sentiment has now overtaken our own convictions, and while our confidence in railroads continues unabated, we feel that duties of a different character are imposed upon us; that of suggesting caution, of preventing mistake, and checking excesses that would impair the usefulness and value of our roads. We desire to see a healthy relation established between their progress and the wants of the country, and their management reduced to a system that shall produce the greatest results, with the least possible expenditure.

While our people have been doing so much, it is a most fortunate circumstance that very little money has been expended upon lines that should be abandoned. Such as have received a large expenditure, will be completed without great sacrifices. In no time, in the previous history of our railroads, could we practice a lesson of caution, so well as at the present. It will involve no sacrifice, while it may save us from a great many.

Statement showing the number of miles of railroad in operation in the United States, January 1, 1854.

MAINE.

Name of Roads,	miles open.
Androscoggin	20
Androscoggin and Kennebec	55
Atlantic and St. Lawrence	82
Bangor and Piscataquis	12
Ruckfield Branch	13
Calais and Baring	6
Franklin	9
Kennebec and Portland	69
Portland, Saco, & Portsmouth	51
York and Cumberland	18
Total	335

NEW HAMPSHIRE.

Atlantic and St. Lawrence	52
Ashuelot	23
Boston and Maine	37½
Bost., Concord, and Montreal	92½
Cheshire	54
Cocheco	28½
Concord	34½
Concord and Claremont	29½
Contoocook Valley	14½
Eastern	16½
Great Falls and Conway	12½
Manchester and Lawrence	26
New Hampshire Central	25½
Northern	81½
Peterboro' and Shirley	10½
Portsmouth and Concord	47
Sullivan	24½
White Mountains	20
Wilton	15½
Total	646½

VERMONT.

Atlantic and St. Lawrence	31
Connecticut & Passumpsic River	61
Rutland and Burlington	119
Rutland and Washington	18½
Rutland and Whitehall	17
St. Lawrence and Atlantic	16
Vermont and Canada	47
Vermont Central	117
Vermont Valley	24
Western Vermont	53
Total	503½

MASSACHUSETTS.

Amherst and Belchertown	20
Berkshire	21
Boston and Lowell	27½
Boston and Maine	83
Boston and Providence	53½
Boston and Worcester	68
Cape Cod Branch	28½
Charles River Branch	12
Connecticut River	50
Dorchester and Milton Branch	3
Eastern	58
Essex	21½
Fall River	42½
Fitchburg	67
Fitchburg and Worcester	18
Grand Junction	6½
Harvard Branch	1
Lexington and West Cambridge	6½
Lowell and Lawrence	12½
Medford Branch	3½
Nashua and Lowell	14
New Becford and Taunton	21½
Newburyport	14½
Norfolk County	20
Old Colony	45½
Peterboro' and Shirley	23½
Pittsfield and North Adams	20
Providence and Worcester	44
Salem and Lowell	17½
Saugus Branch	8
South Reading Branch	8½
South Shore	11
Stockbridge and Pittsfield	22
Stony Brook	13½
Stoughton Branch	4
Taunton Branch	11½
Vermont and Massachusetts	77
Western	117
West Stockbridge	2½
Worcester and Nashua	45½
Total	1091½

RHODE ISLAND.

Providence and Stonington	50
Total,	50

CONNECTICUT.

Collinsville Branch	11
Danbury and Norwalk	24
Hartford, Providence and Fishkill	50
Housatonic	74
Middletown Branch	10
Naugatuck	62
New Haven, Hartford and Springfield	62
New Haven and Northampton	45
New Haven and New London	50
New London, Willimantic, and Palmer	66
New York and New Haven	63
Norwich and Worcester	66
Total,	583

NEW YORK.

Albany and West Stockbridge	38½
Albany Northern	32
Buffalo, Corning, and New York	100
Buffalo and New York City	91
Buffalo and Niagara Falls	22
Buffalo and State Line	69
Canandaigua and Elmira	49
Canandaigua and Niagara Falls	97
Cayuga and Susquehanna	35
Chemung	17½
Eighth Avenue (New York city)	4½
First and Second Avenue	3½
Hudson River	144
Hudson and Berkshire	31½
Long Island	98
New York and Erie	464½
New York and Harlem	130½
New York Central	518
Corning and Blossburgh	15
Northern (Ogdensburg)	118
Oswego and Syracuse	36½
Plattsburg and Montreal	23½
Rensselaer and Saratoga	32
Rochester and Lake Ontario	13
Saratoga and Schenectady	23
Saratoga and Washington	54½
Sackett's Harbor and Ellisburg	18
Sixth Avenue (New York city)	3½
Skaneateles and Jordan	3
Third Avenue (New York city)	4½
Troy and Greenbush	6½
Troy and Bennington	5½
Troy and Boston	261
Troy and Rutland	32
Watertown and Rome	96
Total	2,355½

NEW JERSEY.

Belvidere Delaware	41
Burlington and Mount Holly	6
Camden and Amboy	65
Morris and Essex	45
New Brunswick and Trenton	28
New Jersey	31
New Jersey Central	64
Trenton Branch	6
Union	33
Woodbury Branch	9
Total	328

PENNSYLVANIA.

Alleghany Portage	36
Beaver Meadow	38
Blairsville Branch	3
Carbondale and Honesdale	24
Catawissa, Williamsport, and Erie	25
Chestnut Hill and Doylestown	15
Chester Valley	21
Columbia Branch	18
Cumberland Valley	52
Dauphin and Susquehanna	16
Delaware, Lackawa'a, and West	50
Erie and North-East	19
Franklin Canal	26
Franklin	22
Germantown Branch	6
Harrisburg and Lancaster	38
Hazleton and Lehigh	10
Lehigh and Susquehanna	20
Little Schuylkill	20
Little Schuylkill and Susquehanna	28
Lykens Valley	16
Mahonoy and Wisconisco	17
Mauch Chunk and Summit Hill	8
Mill Creek	9
Mine Hill	12
Mount Carbon	7
Nesquehoning	5
Pennsylvania	256
Pennsylvania Coal Company's	47
Philadelphia and Columbia	80
Philadelphia and Reading	93
Philadelphia, Germantown, and Norristown	17
Philadelphia and Trenton	29
Philadelphia and Westchester	9
Philadelphia, Wilmington, and Baltimore	98
Pine Grove	4
Room Run	6
Schuylkill	13
Schuylkill Valley, incl. branches	25
Strasburg	7
Sunbury and Erie	20
Tioga	26
Trevorton and Mahonoy	15
Whiteha'n and Wilkesbarre	20
Williamsport and Elmira	25
York and Cumberland	25
York and Wrightsville	13
Total	1,375

VIRGINIA.

Appomattox	9
Chesterfield	12
Chesterfield and James River	4
Clover Hill	11½
Greenville and Roanoke	21
Deep Run	4
Manassas Gap	38
Orange and Alexandria	62
Port Walthal Branch	3
Petersburg	63
Richmond and Danville	84
Richmond, Fred., and Potomac	76½
Richmond and Petersburgh	22
Sea-board and Roanoke	80
South Side	62
Tuckahoe and James River Branch	5½
Virginia Central	107
Virginia and Tennessee	73
Warrenton Branch	9
Winchester and Potomac	32
Total,	778½

OHIO.

Bellefontaine and Indiana	118
Central Ohio	59
Cincinnati, Hamilton, and Dayton	60
Cleveland, Columbus and Cincinnati	135
Cincinnati, Hillsboro, and Parkersburg	37
Cincinnati, Wilmington, and Zanesoille	41
Cleveland, Painesville, and Ashta	71
Cleveland, Zanesville, and Cincinnati	14
Cleveland and Pittsburg	100
Cleveland and Toledo, S. Division	87
" " N. "	60
Columbus and Xenia	55
Columbus, Piqua and Indiana	46
Dayton and Michigan	20
Dayton and Western	36
Dayton and Springfield	24
Findlay Branch	16
Greenville and Miami	27
Hamilton, Eaton, and Richmond	45
Carrolton Branch	20
Iron	13
Little Miami	84
Mad River and Lake Erie	134
Mansfield and Sandusky	56
Newark and Mansfield	61
Ohio and Pennsylvania	187
Ohio and Mississippi	20
Ohio and Indiana	32
Scioto and Hocking Valley	44
Springfield and Xenia	19
Total,	1713

NORTH CAROLINA.

Gaston and Raleigh	87
Greenville and Roanoke	21
Wilmington and Raleigh	162
Total,	270

SOUTH CAROLINA.

Abbeville Branch	12
Anderson Branch	10
Camden Branch	37
Charlotte and South Carolina	109
Columbia Branch	67
Greenville and Columbia	143
King's Mountain	22
Laurens	15
South Carolina	137
Wilmington and Manchester	161
Total,	713

GEORGIA.

Athens Branch	40
Waynesboro	51
Central	191
Eatonton	20
Georgia	171
La Grange	81
Macon and Western	101
Milledgeville and Eatonton	35
Muscogee	50
Rome	20
South-Western	50
Warrenton Branch	4
Western and Atlantic	140
Waynesboro'	51
Total,	944

ILLINOIS.

Aurora Branch	13
Aurora Extension	86
Chicago and Mississippi	131
Chicago and Rock Island	140
Galena and Chicago Union	120
Great Western Illinois	81
Illinois Central, sixth division	60
" " Chicago branch	56
St. Charles Branch	7
O'Fallon's Coal Road	8
Illinois and Wisconsin	25
Terra Haute and Alton	80
Peoria and Oquawka	20
Total,	777

INDIANA.

Columbus and Shelbyville	21
Evansville and Crawfordsville	34
Indiana Central	72
Indianapolis and Bellefontaine	84
Jeffersonville	77
Lafayette and Indianapolis	64
Madison and Indianapolis	86
Martinsville	27
New Albany and Salem	191
Newcastle and Richmond	27
Northern Indiana	113
Peru and Indianapolis	50
Shelbyville and Knightstown	27
Shelbyville Lateral	15
Shelbyville and Rushville	20
Terre Haute and Richmond	73
Total,	982

MARYLAND,

Annapolis and Elkridge	21
Baltimore and Ohio	379
Baltimore and Susquehanna	57
Frederick Branch	3
Hanover Branch	13
Washington Branch	31
Westminster Branch	17
Total	521

MISSOURI

Pacific	37
Total	37

KENTUCKY

Covington and Lexington	47
Lexington and Frankfort	29
Louisville and Frankfort	65
Maysville and Lexington	25
Total,	166

TENNESSEE.

East Tennessee and Georgia	82
Memphis and Charleston	50
Nashville and Chattanooga	158
Total,	290

ALABAMA.

Alabama and Tennessee River	50
Memphis and Charleston	43
Mobile and Ohio	33
Montgomery and West Point	88
Total,	214

MISSISSIPPI.

Raymond Branch	7
St. Francis and Woodville	28
Vicksburg and Jackson	60
Total,	95

LOUISIANA.

Clinton and Port Hudson	24
Mexican Gulf	27
Milneburg	6
New Orleans and Carolina	6
West Feliciana	26
Total,	89

WISCONSIN.

Milwaukie and Mississippi	110
Rock River and Union Valley	290
Total,	180

MICHIGAN.

Michigan Central	268
Michigan Southern	204
Pontiac	25
Total,	497

DELAWARE.

Newcastle and Frenchtown	16
Wilmington Branch	11
Total,	27

AGGREGATE STATEMENT.

STATES.	Miles open.	Area in Sqr. miles.	Population in 1805.
Maine	335	30,000	583,188
New Hampshire	646	9,280	317,964
Vermont	504	9,056	314,120
Massachusetts	1,091	7,800	994,499
Rhode Island	50	1,306	147,544
Connecticut	583	4,674	370,791
New York	2,355	46,000	3,097,393
New Jersey	328	8,320	489,555
Pennsylvania	1,375	46,000	2,311,786
Delaware	27	2,120	91,535
Maryland	521	9,356	583,035
Virginia	779	61,352	1,421,661
North Carolina	270	45,000	868,903
South Carolina	713	24,500	668,507
Georgia	944	58,000	905,999
Florida	.....	59,269	87,401
Alabama	214	50,722	771,671
Mississippi	95	47,156	606,555
Louisiana	89	46,431	517,739
Texas	...	237,321	212,592
Arkansas	...	52,198	209,639
Tennessee	290	45,600	1,002,625
Kentucky	166	37,680	982,405
Missouri	37	67,380	682,043
Ohio	1.713	39,964	1,980,408
Indiana	982	33,809	988,416
Illinois	777	55,405	851,470
Michigan	497	56,243	397,654
Wisconsin	130	53,924	305,191
Iowa	..	50,914	192,214
California	..	188,982	164,000
	15,511	1,485,361	23,108,504

Kentucky Coal Fields.

The Coal Fields of the West are, we are glad to perceive, attracting very general attention; and coal lands which, but a few years since, were valueless, are now becoming duly appreciated. At *Pittsburgh*, coal lands favorably situated; that is, where the coal is of easy access from the River, are worth from ten to fifteen hundred dollars per acre; while those less favorably situated, readily command five hundred dollars per acre. And so at the few points on the Ohio between Pittsburgh and Cincinnati where coal is found near the River, and although the veins are very thin, the value of the land has recently increased a hundred fold.

The Louisville *Journal* of the 4th of November, speaking of the opening of some coal mines more than three hundred miles south of that city on the Kentucky side, predicts enormous profits to the "*Union Coal and Iron Company*," from its working its coal veins alone, which are three in number and only three feet thick, underlying three thousand acres. The capital of the Company is one million of dollars, and the coal is brought by railroad to the river bank at a cost of less than *three* cents per bushel; when the demand far exceeds any possibility of supplying it, at *nine* cents per bushel. We quote from the *Journal* of 4th November:

"Some six or eight months ago, a company of gentlemen from Louisville, consisting of Col. G. H. Monsarrat, Col. Stapp, and S. F. J. Trabue, Esq., acting under a most liberal charter from the State of Illinois, proceeded to make, after a thorough survey of that portion of the western coal field lying upon and adjacent to the Ohio River, large purchases of valuable lands, containing not only the most superior coal, but very rich iron ore. Shrewd business men, they readily perceived the amount of profit to be realized from coal, which cost them, delivered from their mines on the banks of the river, a fraction *less than three cents per bushel, and which always commands a ready market at from eight to ten cents per bushel.* They determined, therefore, to proceed at once to the development of a portion of their property, so as to be able if possible to supply any demand which might be made upon them by the first of November or December.

* * * *

"We do not speak too strongly upon the subject, for, besides conversing with a number of intelligent gentlemen who have made private examinations of the property since its development, we have before us copies of official reports, one made by the most eminent geologist in the East, Col. John Pickell, and the other by Dr. George Stealy, at present civil engineer of the city of Louisville, who has spent most of his life in practical examinations of the geological formations of the West—extending from the Alleghany mountains to the Pacific ocean itself—all going to show that the gentlemen of the Union Coal and Iron Company are the owners of property, which, when fully developed, will be a source of profit to them beyond which they need ask nothing more.

In reference to the amount of coal estimated to be contained in this tract of the company's property, we may be permitted to make the following extract from Col. Pickell's report:

"Taking the average thickness of the coal at three feet, which is a deduction of 25 per cent. from its thickness, would give each vein underlying an acre, 130,680 bushels—or in the four veins 522,720 bushels. And making a similar deduction in the extent of the property, bringing it to 3000 acres, it would make up in the aggregate, fifteen hundred and sixty-eight millions one hundred and sixty thousand bushels (1,568,160,000), which would supply a demand of 50,000 bushels per day for one hundred years, estimating the year at three hundred days."

We quote the concluding paragraph of the Colonel's report with this remark, that the regular and fixed price of coal at this mine and those on the lower Ohio is *nine* cents instead of *seven*, thereby giving the company a much greater profit than he estimates.

"Miners will excavate and deliver at the mouth of the entries (100 bushels to each miner) 20,000 bushels, at a cost to the company of 8 cents per bushel or $600.

The coal is now supplied to steamboats at 7 cents per bushel—making for 20,000 bushels, $1,400—or a net profit of $800 amounting in a year of 300 days to $240,000—equal to the interest at 6 per cent. upon $4,000,000.

However extravagant these calculations may appear, they are predicated upon facts which cannot be controverted—they are confirmed by the mineral character of the property; and I have little doubt, under the auspices of an efficient organization, they can be fully realized."

The same paper of the 14th of November, calls upon the Legislature to take measures for opening Railroads to the interior, by which it alleges, and we doubt not truly, that the City of *Louisville* could be readily supplied at less than TEN cents per bushel, (three dollars per ton,) while they are now dependant for an irregular supply from up the river at "*from* TWENTY *to* FORTY *cents per bushel, at the caprice and whim of the speculator*"—being from six to twelve dollars per ton. The Cincinnati *Advertiser* in like manner, has been complaining of the exorbitant price of coal in that city, and its final entire exhaustion, (and final stoppage of their manufactories,) when it insists that if sufficient capital could be invested into the business, the enormous wants of the city could be supplied at TWELVE cents per bushel throughout the year. It ridicules the idea of getting a supply from any other source than the *River*, and urges the investment of capital which would pay enormous returns, while hereafter the inhabitants of "the Queen of the West," could safely rely upon a steady supply of coal at *twelve* cents per bushel, or $3,60 per ton. We quote

(*From the Louisville Journal, Nov.* 14, '58)

"At Tradewater and Caseyville from eight to twelve thousand bushels of coal are taken out daily—four to six thousand bushels from each.—These mines are nearly three hundred miles *below* Louisville and about thirty above the great *iron hill* and coal property of the "Union Coal and Iron Company." They are situated in Union County, Kentucky, and have *always found a ready market for every bushel which they have been able to furnish.* The cost of mining at the river bank is a fraction less than three cents per bushel; whilst the selling price *has been fixed at nine cents per bushel.* The coal is bituminous and of a fine quality, containing but little impurity; and for steam purposes it has been found to be equal to any upon the Ohio river.

"The question will now naturally present itself to the minds of many, whether, when these mines are fully developed and worked to their utmost capacity, and when other mines shall have been discovered, improved and placed in successful operation, the immensity of the supply of coal will not destroy the market, reduce the price to an almost nominal figure, and ruin those who have embarked their capital and devoted their time to its developement. To him who reflects for a moment, the question is one of easy solution. Wherever coal has been used at all as a fuel, it has been found that, unlike most other commodities, *the supply begets the demand.* Many years ago the steamers upon the Western waters had their furnaces and flues constructed for the use of wood exclusively—the supply of coal being limited to a very narrow compass. They were always glad however, to use coal whenever they could get it, inasmuch as it was found, for the purpose of generating steam, to be cheaper than cordwood by at least fifty per cent. As coal banks were opened and the supply increased, the demand became greater, until finally there is scarcely a steamer navigating the Western waters which has not its furnaces and flues so constructed as to use coal; and *actual experiment* has so thoroughly demonstrated its great advantage over cord wood, that *there is not now a steamer in all the Western Trade which would not use it exclusively if assured that the demand could always be supplied.* The number of steamers upon our Western rivers, all of which will eventually resort to the use of coal, is estimated at eight hundred at the present time. The average quantity of coal consumed per day by each may be estimated at three hundred bushels, and the number of days running time, at two hundred and fifty. This estimate, it will be seen, shows an annual demand, for steamers alone, of sixty millions of bushels, and a saving to the steamboat interest of several millions of dollars. Add then, say forty millions of bushels, for consumption in our Western cities, towns and manufactories, which is probably a low estimate, and the demand may be reasonably set down at one hundred millions of bushels, [three millions four hundred thousand tons]. If our Western coal bank could furnish this amount *to-day*, it would find a ready market, *but they cannot do it and will not be able to do so for years to come.* In the meantime our commerce is expanding. The number of our steamboats is consequently increasing, and our cities, towns and manufactories are growing, and will require every five or ten years *double the amount of fuel consumed.* From these premises it follws:

"*First*, That the investment of capital in the development of our coal interests is one of the most, if not the very most, advantageous investments that capitalists can make.

"*Secondly*, That the development of these interests will entirely do away with the use of wood upon our steamboats, and in most of our cities, towns and manufactories, substituting coal, and thereby save to consumers upwards of *one half* the cost of fuel, to be appropriated in the construction of railways, building houses, steamboats, or in any other legitimate use of capital.

"*Thirdly*, That however great the supply, there

will always be found a sufficient demand to make it a paying investment, though the present profit should be reduced *one half*, an event highly improbable, if not out of the question."

From these facts put forth at *Louisville* and Cincinnati, it is manifest, that those who are so fortunate as to possess coal lands within available distance of the Ohio, and the necessary capital to work them, are certain to realize enormous profits upon their investments without any dimunition from a prospect of an ultimate glut of the market, which as the *Louisville Journal* truly says, is not only a rapidly increasing market, but one which has been open for years without any prospect of a reasonable supply.

In connection with the subject we copy the following from the Cincinnati Commercial Advertiser, of Aug. 25th, 1853:—

"It seems somewhat singular that the statement "coal is scarce and high" should be so often applicable to this city: but such is the case now, and such has often been the case, the past few years. There is a cause for this undoubtedly, and one that is susceptible of remedy. The source from which we obtain our supplies is convenient, and the supply inexhaustible; and if a proper course was adopted our citizens could be furnished with good coal *always* at twelve cents per bushel. (14s. 6d. sterling per ton.)

"The annual consumption of coal in this city was, at the three different periods specified, as follows:

	tons.
1840	24,000
1846	82,000
1852	170,000

"It is quite evident from the above statement, that the increase in the consumption of the article, has far outrun the means of supply; hence the citizens within the past few years have had to pay enormous prices occasionally. It is quite evident *there is not now sufficient capital invested in the trade to supply the immense and rapidly increasing demand for the article.* There should be always, at least eighteen months supply in the yards, but of this the capital now employed will not admit.

"A company with sufficient capital, controlling good mines, who would establish two or more large depots in this city, and adopt more speedy means of transporting the coal to this market, and discharging it from their boats to the yards, and fix the prices at twelve cents a bushel, would find that the market could not easily be overstocked.

Considerable has been said about supplying this city with coal, by *Railway at eight cents* a bushel, but *the idea is practically absurd.* It is to the river we must look as the proper channel through which we are to be supplied with this article. and to it alone."

The importance of a steady and abundant supply of *coal* is felt to be as necessary to the commercial and manufacturing operations of the *West*, as the East, while the present available supply is much more limited. We happened to be in the city of Cincinnati in the latter part of October, and found a complete panic prevailing in reference to the small quantity on hand in that city, and which threatened to put out the fires, both in manufacturing establishments and private houses. The only hope of relief was in a "rise of water." The want then felt has yet been only partially met. The development of the above mines will open a much needed source of additioual supply.

The use of coal is rapidly increasing on the Mississippi, and as the above fields are most easily reached from that River, of any upon its bank, the demand from this quarter must be very great. There is no one article in social economy, the use of which increases so rapidly as *coal*, and none the demand for which, so constantly exceeds the supply. The line of the Ohio River is to be the focus of population, wealth and commerce in the West, and the progress of all these will depeud very much upon the cheapness of FUEL.

On the Waste Heat of Locomotive Boilers.

BY ZERAH COLBURN.

A boiler, of any description, performs two offices: those of the *generation* and *absorption* of heat. The former is carried on in the furnace, the latter from both the furnace and tubes. Hear may be generated and lost in the open air, in which case there are not sufficient means for absorption; it may also be generated and absorbed to such an extent that on its escape it has a temperature below that of the required pressure of steam; in which case the pressure falls until its natural relation to temperature is restored. The extreme absorption of heat is attended with economy of fuel in the production of a given weight of steam of an inferior pressure,—an economy which condensing engines, with plenty of room for boilers, may avail of,—but one which is not to be obtained to the same extent in the use of locomotives. The higher the pressure of steam, the greater is the economy of *space* necessary for its application, and the less is the relative resistance of the atmospheric, or equivalent exhaust pressure. Economy in space and in back pressure is of the utmost consequence in locomotives, and the former *must* be had, even with a sacrifice of economy of heat.

Extreme absorption of heat may occur from too great extent of absorbent surface, compared with the natural passage of air through the furnace; and also with a given extent of absorbent surface, by a reduction in the amount of air consumed. In the former case the pressure is likely to be reduced; in the latter the combustion, and necessarily the evaporation, is slow, and the engine does not make steam quickly nor of high pressure.

In any case, the heat *imparted* by the tubes at the end of the circulation, or front ends of tubes, must be no less than that of the required pressure of steam. The heat *imparted* cannot be that *conveyed* by the tubes at their forward ends, as the powers of conduction through metals and through air is different, the atmospheric dissipation being assisted, also, by the *draught*. If the tubes impart, at their forward ends, but *one-half* the heat they convey, and steam of 150 lbs. pressure, above that of the atmosphere, is desired, the escaping heat must be (150 lbs. =368½°) 737°. If absorption goes on to an extent sufficient to reduce this temperature to 680° the consequence is 680°+2= 340° corresponding with 102 lbs. pressure, nearly; a great reduction, certainly.

Now, absorbent surface, only, involves *weight*. To provide for the sufficient admission of air does not affect the weight; it is only the question whether the same absorbent surface shall be disposed in a smaller number of larger tubes, with larger thimble-openings: whether the furnace can have sufficient capacity, with such relation of length, width and depth, as shall offer the least resistance of fuel to the passage of air. For neither of these adjustments is there any difficulty: the only point is to guard against the *unnecessary waste* of heat. We only need to know when there is heat enough. This can only be got at by approximation; for the actual proportions of generating room and absorbing surfaces, air openings, etc., are only deduced, for a given duty of evaporation, by practical observation. This being a question of practice and experiment, practical results can only be given. Engines with a large tube surface, with tubes of small diameter and tightened by thick thimbles; with narrow furnaces, proportionally deep, and often filled to the crown; are found, in practice, not to make steam enough, except with a considerable contraction of the blast pipes. Opposed to these are the general examples of large tube engines, with thin thimbles and wide furnaces, which are found to make steam much faster, and of higher pressure. The little engines built at Lowell in 1840, having 2¼ inch tubes, and furnaces nearly *twice* as wide as long, were notorious for their steaming powers. Here are the general facts, we may say the *extremes*:—we want the *mean*. Combustion, and consequently, (with sufficient absorbent power,) evaporation, being proportional to the amount of air consumed, we must admit all the air which the carbon of the fuel will take up under the most rapid rate of combustion. If this must be reduced the damper must be used, and in no case must the contraction of the grate and tube-openings act as a *permanent damper*. Damping at each end of the boiler prevents the formation or escape of carbonic acid, the normal product of combustion; damping at the furnace end, unless perfectly tight, allows the *formation* and escape of carbonic oxide, an extravagant and wasteful consumption of fuel. How much more extravagant the consumption of fuel when the production of carbonic oxide is permanent, owing to permanent suppression of oxygen.

Seeing that the ultimate absorption of heat in the tubes must affect the pressure, and that the highest safe pressure is a necessary condition of economical working, brings us to the main subject, the waste of heat necessary in boilers, unless retained by other means than by absorbing it directly from the tubes into the steam-producing water. The temperatures of steam, necessarily corresponding with the ordinary working pressures, are as follows:

70 lbs.	equal to 317.8°	120 lbs.	equal to 352.4°
80 "	" 325.8°	135 "	" 360.8°
90 "	" 333.2°	150 "	" 368.5°
105 "	" 343.3°	165 "	" 375.6°

It being obviously necessary that the imparted heat at the forward ends shall not be less than the temperature corresponding with the required pressure; and that it is impossible for the heat imparted to equal that conveyed, there must necessarily be a large amount of waste heat continually escaping from the ends of the tubes. Allowing the proportion conveyed to be twice that imparted, our table will stand:

70 lbs.	equal to 635.6°	120 lbs.	equal to 704.8°
80 "	" 651.6°	135 "	" 721.6°
90 "	" 666.4°	150 "	" 737.0°
105 "	" 686.6°	165 "	" 751.2°

In England the temperature of the interior of the smoke box has been found to be from 400° to 800°, that in the furnace, with coke fire, being at least 3000°. In Mc. Connell's locomotives, with combustion chambers and short tubes, the temperature] has been found to be from 1100° to 1200°.

This heat, otherwise wasted, can be partly absorbed by feed water, provided enough heating surface can be presented. If the tubes are prolonged beyond the ordinary tube sheet, and fastened in an additional sheet, the space enclosed will give room for the feed water, with a large extent of heated surface for the elevation of its temperature.

The numbers taken to represent the amount of waste heat are not assumed as correct, but only as indications. It is well ascertained, however, that air of an average temperature of 600° escapes from the tubes. If enough heat can be extracted to raise the feed from 55° to 212°, or perhaps higher, it is so much saved, while the exhaust steam is unaffected.

A difficulty with heaters has been, that they have either depended on the exhaust steam for heat, and thereby abstracted so much from the means for producing the draught, or that being formed only within the smoke box, they become leaky, and having so little surface exposed to the heat, they were not efficient.

With a heater, such as I have proposed, the connection of the feed-pipes, check-valve, etc., would be made in the manner usual in the application of other heaters, there being a check-valve between the heater and boiler, and the heater being formed of the same strength as the boiler.

Journal of Railroad Law.

CAN RAILROAD COMPANIES BE AUTHORIZED TO SUBSCRIBE TO THE STOCK OF OTHER AND FOREIGN COMPANIES?

That the granting of such authority has been decided to be within the scope of Legislative power in our State, is known to most of our readers. Such was the ruling of the Supreme Court in the case of *Hugh White against the Syracuse and Utica Railroad Company*. This case is reported in the lately published 14th volume of Barbour's Reports, and we would succinctly state the nature of the case and the grounds upon which the opinion pronounced by Justice Edwards upon this occasion seems to have principally rested.

In 1851 the New York Legislature authorized any of our Railroad Companies to subscribe to the stock of the Great Western Railroad, CanadaWest, with the consent of persons owning 2-3ds of its stock, under certain restrictions. Defendants accordingly subscribed for $75,000 of the stock. The calls amounting to $7500 were paid and plaintiff brought a suit in order to compel the Directors of the S. and U. Company to refund the sum so paid, and also to restrain them from making further payments.

The Court held

1st that the charter of the defendants was liable to suspension, alteration and repeal in the discretion of the Legislature. A charter must be construed according to its spirit. And it was not proposed by the Legislature to convert the Syracuse and Utica Company into a new Company of a distinct character from its present one. The objects and business of the Company would, if the Law should take effect, remain unchanged. The surplus capital of the Company, employed as contemplated would probably, by increasing the number of persons coming into this State, increase the business of defendant's road, and would thus be used in a manner fully compatible with the general scope of the Charter instead of subverting the Charter as contended by the plaintiff.

2nd. The cases of the *Hartford and N. H. R. R. Co.* vs. Croswell (5 Hill 381)and of the Middlesex Turnpike Co. vs. Locke (8. Mass. Rep. 268) have been cited to show that the assent of all the Stockholders is necessary in such a case as this. But in neither of these two cases had the Legislature reserved the right to alter the Charter of the Companies.

3d. Nor is the Legislative Act conferring the authority in question invalid because it was not passed by ⅔ds of the Legislature as required by the Constitution of 1821 under which the defendants were chartered.

For that Constitution contained a provision by which it could be changed, at the People's will by the operation of which the control of future Legislatures over the charters of Corporation could be enlarged.

The Constitution of 1821 has been so changed, and the Legislative former once Charters, enlarged.

4th. Nor is the Legislative Act unconstitutional as being a private or local Act and at the same time embracing more than one subject, thereby violating the Supreme law of our State, which prohibits complex Statutes. It is not a private Act, for it applies to *all* Railroad Companies. And the *subject matter* of the Bill is single, consisting solely in authorizing subscriptions under general restrictions to a single description of stocks.

$1,000,000 LITTLE MIAMI RAILROAD COMPANY SIX PER CENT. FIRST MORTGAGE BONDS FOR SALE.

OFFICE OF WINSLOW, LANIER & Co. }
No. 52 Wall-st., Oct. 6, 1853. }

THE LITTLE MIAMI RAILROAD COMPANY offer for sale one million of their SIX PER CENT. BONDS, with coupons. Interest and principal payable in New York, the former half-yearly, 1st of November and 1st of May. They are in sums of $1,000 each, payable the 1st day of May, 1858.

These Bonds are issued under the express authority of the Legislature of the State of Ohio; and are a part of the $1,500,000 Loan authorized to be issued by a vote of the stockholders, for the purpose of raising means to make a double track; the greatly increased and increasing business of the road makes this absolutely necessary.

The Little Miami Railroad is eighty-four miles long, commencing at the City of Cincinnati and terminating at Springfield; is now in complete running order; has cost, including equipments, stations, station-houses, &c., up to this date $2,708,109 19.

This Company hold stock in the Columbus and Xenia Railroad Company to the amount of $386,000, which now commands a premium of 20 per cent. Also, in the Hillsborough Road the amount of $11,716.

The receipts of the Road have been as follows:

For the year ending Dec. 1, 1844.....	$18,623 36
For the year ending Dec. 1, 1845.....	46,327 58
For the year ending Dec. 1, 1846.....	116,052 02
For the year ending Dec. 1, 1847.....	221,139 52
For the year ending Dec. 1, 1848.....	280,085 78
For the year ending Dec. 1, 1849.....	321,398 82
For the year ending Dec. 1, 1850.....	405,597 24
For the year ending Dec. 1, 1851.....	487,845 89
For the year ending Dec. 1, 1852.....	526,746 35
The receipts from Dec. 1, 1852, to Sept. 1, 1853, 10 months were.....	544,625 59
For the same period year before.....	411,797 06
Increase in 10 months.....	$132,823 53

The position of this road, being the natural, shortest and most usually travelled route from Cincinnati and the vast country south and west of it, to the northern cities, must ever make it one of the most important and profitable lines in the country.

An inspection of a map will show its connections to be many and important. This road operates the Columbus and Xenia Road, and runs in connection with the Cleveland and Columbus Road; in fact they are now run as one line greatly to the advantage of all.

Regular annual 10 per cent. dividends have been declared since December, 1847, with an extra dividend of 5 per cent. in 1852. In 1852 two cash dividends of 5 per cent. were made.

The present surplus and reserve fund amounts to.....	$98,546 10
The mortgage covers the entire line of road, costing to date...	2,708,108 19
To be expended on double track, &c.	1,500,000 00
Value of security.....	$4,208,109 19

The security for the payment of these Bonds is one of the most ample character, being a first and only mortgage or deed of trust (excepting one of $100,000 to the City of Cincinnati) on the Company's Road, Stations, Franchises, net income, &c., to J. F. D. LANIER, Esq., of this city, in trust for the bondholders, with ample power to take possession of the Road, its real and personal estate, franchises, &c., and to sell the same to the highest bidder for cash, if default be made in payment of interest or principal. The mortgage is for $1,500,000, and cannot be increased.

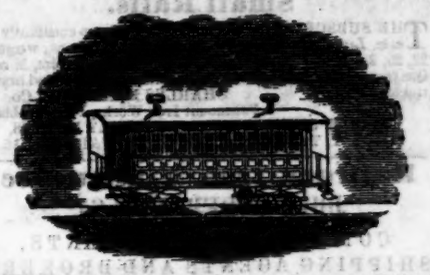
The Stock owned by the Road in the Columbus and Xenia and Hillsborough Railways will much more than pay off the $100,000 prior lien to the City of Cincinnati, and all other debts of the Company, excepting this loan of $1,500,000.

These Bonds are offered at private sale by the undersigned, Agents of the Company.

Printed statements of the affairs of the Company, and any further information relative to the securities, will be given by

WINSLOW, LANIER & CO.,
No. 52 Wall-st.

Elmira Car Manufactory.



THE Undersigned is prepared to manufacture for Railroad Companies, Passenger, Baggage, Cattle, Freight, Gravel and Hand Cars, also Baggage Barrows and Freight Trucks.

WM. R. RUTTER.

Elmira, N. Y., June 1, 1853.

The Hamilton Car Company,

ARE prepared to Contract for the Manufacture to order Rail Road Cars of every description, such as Passenger, Baggage, Freight, Dumping and Hand Cars, &c. &c.

Having ample facilities for Manufacturing at the lowest rates, and being supplied with Eastern Mechanics in every department under the Superintendance of H. P. Lanckton, who has had charge of T. W. Wason's well known establishment at Springfield Mass., for the last Six years, we can guaranty ours to be equal in style and quality to any manufactured.

Car Manufacturers and Rail Road Companies Supplied with Car wheels from the most approved patterns at the lowest prices. Castings of all kinds for Cars, Rail Road Bridges, &c. made to order at short notice.

Orders Respectfully Solicited.

Address, HENRY SIZER, *Agent*,
Cincinnati Ohio.

Office 596 Fifth Street, Cincinnati, at Rail Road Depot Building.

Railroad Car Works.

THE Undersigned are prepared to manufacture for Railroad Companies, Passenger, Baggage, Cattle, Freight, Gravel and Hand Cars, also Baggage Barrows and Freight Trucks.

P. HUNGERFORD & CO.

Maysville, Ky., Sept. 29, 1853.

Hufty's

Engineers, Architects and Draftsmen's

STATIONERY EMPORIUM.

WHATMAN'S Turkey Mill Drawing paper, Tracing paper, Plan and Profile, Protractors, Drawing Pins, Faber's, Jackson's and other makers' Pencils; Field, Level, and Memorandum Books of various patterns; Mathematical Instruments, Tape-lines, Mouth Glue, Cross Section paper, Triangles, Sabel Brushes, Gum Bands, Maiden Gum, Red Tape, Ink, Inkstands and Sand, Water Colors, Pallets, Patent Binders for letters, Portfolios, etc., together with a general assortment of Stationery and Blank Books.

All goods packed with care, and forwarded to any part of the United States.

JOSEPH HUFTY,
Successor to H. L. Lipman,
139 Chestnut st., Philadelphia.

May 15, 1851.

Buffalo Car Works.

TOWNSEND & COIT, Proprietors.

WE are now erecting an extensive Establishment for the manufacture of Railroad Cars, which will be furnished with all the conveniences known to the business, and ready for operation by the 1st day of June next, at which time we will be ready to execute orders for Baggage, Box, Platform and Cattle Cars, of the most approved style and finish. Meantime we are prepared to make contracts for work to be furnished during the summer and fall.

TOWNSEND & COIT, Buffalo.

February 22, 1853.

A. N. GRAY, Cleveland, O.,

RECEIVER AND FORWARDER of Railroad Iron, Chairs and Spikes

Also, Cars, Locomotives, and all kinds of Machinery for Railroad purposes.

Office next door to the Custom House, Main st.

January 12, 1853.

SIXTY MILES DISTANCE SAVED!—ONLY THIRTY-SIX AND A HALF HOURS TO CHICAGO.

MICHIGAN SOUTHERN RAILROAD LINE, carrying the Great Western U. S Through Mail—FOR CHICAGO AND ST. LOUIS, MILWAUKEE, RACINE KENOSHA, and all Ports on Lake Michigan.—Through from Buffalo to Monroe IN FOURTEEN HOURS WITHOUT LANDING.

The following magnificent and unequalled steamers from the line between Buffalo and Monroe:

EMPIRE STATE. J. WILSON, Commander, leaves Buffalo Mondays and Thursdays.

SOUTHERN MICHIGAN, A. D. PERKINS, Commander, leaves Buffalo Tuesdays and Fridays.

NORTHERN INDIANA, I. T. PHRATT, Commander, leaves Buffalo Wednesdays and Saturdays.

One of the above splendid steamers will leave the Michigan Southern Railroad Line Dock, at 9 o'clock, P. M. every day, (except Sundays) and run direct through to Monroe without landing, in 14 hours, where the Lightning Express Train will be in waiting to take passengers direct to Chicago in 8 hours; arriving next evening after leaving Buffalo.

THE LAKE SHORE RAILROAD.

runs in connection with this line, forming the only continuous line of Railroad to Chicago and the Illinois River.

For Through Tickets, by New-York and Erie and Buffalo and New-York City Railroad via Buffalo, or by the People's Line of Steamboats, Hudson River Railroad via Albany and Buffalo, apply to

JOHN F. PORTER, Agent,
No. 193 Broadway, corner Dey-st., N. Y.

MONTREAL & NEW YORK AND Plattsburgh and Montreal RAILROADS.

☞ *Open through from Plattsburgh to Montreal.* ☜

Passenger Trains leave Montreal for Plattsburg at 9 30 a.m and 5 p.m., arrive at 8 a.m, and 7.30 p.m.

Leave Plattsburg for Montreal 7.30 a.m. and 4 p.m., arrive a 10 a.m. and 6.50 p.m.

Trains connet at Montreal with Steamers for Quebec, and the St. Lawrence and Atlantic Railroad for Sherbrooke and intermediate station.

Trains connect at Mooers Junction with Northern (Ogdensburgh) Railroad for Ogdensburgh and Lake Ontario Steamers for Lewiston, Niagara Falls and Upper Canada, and all ports on the Western Lakes.

Trains connect at Plattsburgh by Steamer to Burlington with Rutland and Burlington Railroad and connecting lines for Troy, Albany, New York and Boston, and all intermediate stations. Also with steamers for Whitehall to the Saratoga and Washington Railroad, and connecting lines of road to Troy, Albany and New York.

Passengers will find this route unequalled for comfor and dispatch, and attended with less fatigue and dely than any other. It possesses moreover the advantage of a short Ferriage of only *fifteen minutes* across the River St. Lawrence at Caughnawaga, which has never been known to freeze, and can be confidently relied upon at all seasons of the year.

☞ Frieght Tarins run daily each way.

For particulars see Frieght and Passenger Tariff.

BAGGAGE *checked through.*

H. W. NELSON, Superintendent.

New York and Erie R. R.

PASSENGER TRAINS leave Pier foot of Duane street, as follows, viz:—

DAY EXPRESS, at 6 a. m. for Dunkirk and Buffalo.

MAIL, at 8½ a.m. for Dunkirk and Buffalo, and all intermediate stations. Passengers by this train will remain over night at any station between Binghamton and Corning, and proceed the next morning.

ACCOMMODATION, at 12½ p.m. for Delaware and all intermediate stations.

WAY, at 3½ p.m. for Delaware and all intermediate stations.

NIGHT EXPRESS, at 5 p. m. for Dunkirk and Buffalo.

EMIGRANT, at 6 p.m. for Dunkirk and all intermediate stations.

On Sundays only one Express Train—at 5 p.m.

The Express Trains connect at Dunkirk with the Lake Shore Railroad for Cleveland, Cincinnati, Chicago, etc., and at Buffalo with first class splendid steamers for Cleveland, Sandusky, Toledo, Detroit and Chicago.

CHAS. MINOT, Sup't.

Notice to Contractors.

WARSAW & ROCKFORD RAILROAD.

THE preliminary Surveys are now complete for the First Division, (about 120 miles) from Warsaw, through Nauvoo, Oquawka, Keithsburgh, Rock Island and to Port Byron, including both Rapids of the Mississippi, and the location progressing. The character of the country is such, and the surveys so near to any location that will be made, that Contractors can satisfy themselves of the value of the work as well now as hereafter. Proposals are asked at the Office of the Company in Warsaw, Hancock County, Illinois, for the construction of the whole or part of the road, either by quantities or by the mile. Contract will not be made before the 1st of January, 1854, and only so soon thereafter as advantageous offers can be made. The Company are willing to make general contract, for cash or for cash and securities.

The route of the road is generally in the valley and second bottoms of the Mississippi, and the work can be completed very rapidly. The road is important as one of the improvements of the navigation of the Rapids, and also from its several (two at least) connections with other railroads.

WM. H. ROOSEVELT,
President.
W. R. KINGSLEY,
T. S. O'SULLIVAN, Engineer.
Consulting Engineer.
Warsaw, Nov. 17, 1853.

Drawing.

B. BLANDOWSKI, Topographical and Ornamental Draughtsman and Designer. Maps accurately drawn, enlarged or reduced from notes or copies. Ornamental designs for decorations, furniture, fences and ornamental foundry work. Architectural designs. Drawings from nature carefully prepared.

REFERENCES. Messrs. Miller and Freund, Ligneous Marble Works, corner of Franklin and Center streets, New York. Also H. V. Poor, Esq., Editor Railroad Journal, and Zerah Colburn, Assistant do.

Address, care of Railroad Journal, 9 Spruce street New York.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by POWERS & WEIGHTMAN, manufacturing Chemists, Philadelphia.
Jan. 20, 1849.

To Railroad Companies, Machinists, Car Manufacturers, etc., etc.

CHARLES T. GILBERT,

NO. 80 BROAD ST., NEW YORK,

IS prepared to contract for furnishing at manufacturer's prices—
Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention

Krupp's
CELEBRATED CAST STEEL,

Which obtained the Council Medal at the London Exhibition in 1851.

Warranted unapproachable as to Quality and Size.

PLATERS and other Cast-Steel Rollers, of any dimensions not exceeding six feet long by eighteen inches diameter.
Piston Rods and Shafts for Steam Engines, not exceeding 3000 lbs. in weight.
Railway and other Axles, Cranks, Springs and Tyres.
Cannon, Rifle and Gun Barrels.
Mint and other Rolling Mills

Orders received by
THOMAS PROSSER & SON,
28 Platt street, New York.
Sole Agents for the United States.
Nov. 19, 1853.

Machinists' Tools.

A SUPERIOR CLASS,

DESIGNED particularly for Railroad work, manufactured by L. B. TING & CO., (late ALDRICH, TING & Co.,)
October 7, 1853. LOWELL, MASS.

Henry I. Ibbotson,

MANUFACTURER OF
FILES AND SAWS,

Warranted of superior quality.
Office and Warehouse, 218 Pearl st., New York.

Small Rails.

THE SUBSCRIBERS manufacture and keep constantly for sale, *Light Rails* of the most approved patterns, weighing 22, 25, 28, 40 and 50 lbs per yard, suitable for Colliers, Miners, Quarrymen and Contractors, or for turn outs, depot and branch tracks. CHARLES E. SMITH & Co
1744 Fairmount Iron Works, Philadelphia.
CHAS. E. SMITH, HENRY MORRIS,
THOS. T. TASKER, WISTAR MORRIS.

Railroad Iron Via Quebec.

JOHN ANDERSON & Co.,
COMMISSION MERCHANTS,
SHIPPING AGENTS AND BROKERS,
QUEBEC,

PARTICULAR attention given to the Transhipment of Iron in Transitu for the Western Lake Ports, likewise to the Shipment of Rails in Grea. Britain.
Quebec. Dec. 2, 1853.

Railroad Iron.

TWO THOUSAND TONS Erie Pattern, 58 lbs. to the yard, already shipped, and expected here soon—for sale by
38tf JOHN H. HICKS, 90 Beaver st.

To Railroad Companies.

COLLINS' PATENT
VENTILATORS,

FOR
Ventilating all kinds of
PUBLIC AND PRIVATE BUILDINGS
Railroad Cars, Depots, etc.

THE Subscribers would invite the attention of the public to the above celebrated Patent Ventilator. This Ventilator is the best one now known of, for giving a pure air in rooms, and ejecting all foul air. It has been adopted by all the principal Railroad Companies and Car Factories, and is extensively used for private dwellings, and for the cure of smoky Chimneys cannot be excelled. Manufactured and for sale by

BAKER & WILLIAMS,
No. 406 Market st., Girard Row,
Sole Agents for Pennsylvvnia.

CERTIFICATES.

Engineer Department P.R.R., Altoona, Feb. 8, 1853.
This is to certify that Messrs. BAKER & WILLIAMS, of 406 Market st., Philadelphia, have furnished a large number of Collins' Patent Galvanized Iron Ventilators for the P. R.R. Co., and that they have given every satisfaction, acting fully as represented. I consider them as a necessary appendage to an Engine House. We have them in use thirteen inches, and two feet diameter, acting equally well. So well satisfied am I of their usefulness, that the Engine Houses we are about building will be supplied with them at every point where a draft is necessary to free building of smoke. STRICKLAND KNEASS,
Principal Assistant Engineer P. R.R. Co.

Engineer Depart. P. R.R. Co., Pittsburgh, May 12, 1853.
Messrs. BAKER & WILLIAMS,
Dear Sirs—The 23 Collins' Patent Ventilators furnished by you for the Engine House at this place, have been in use several months and their merits have been fully tested and have given most perfect satisfaction; being constructed on true principles of Ventilation, and the workmanship is of a substantial and superior character. Yours truly, OLIVER W. BARNES,
3m40 *Principal Assistant Engineer P. R.R. Co.*

India-Rubber Railroad Car Springs, etc.

THE UNITED STATES CAR SPRING COMPANY, having completed their new Factory, are manufacturing and furnishing to *Railroad Companies*, and *Car Builders*, *RUBBER SPRINGS* of the best quality, on the most favorable terms.
Also, McMullen's superior *WHITE HOSE*, not only for Railroads, but all other purposes, and of any size or thickness required. Office No. 25 Cliff street,
Aug. 10, 1853. 3m New York.

Railroad Iron.

2,000 TONS FIRST CLASS WELSH RAILWAY IRON, to be made to any ordinary T pattern required by the buyers, and for shipment from Newport, Wales, in December, January, and March next, apply to the undersigned, for many years connected with the largest house in the trade. JOHN H. AUSTIN & CO.,
44tf 2 Ingram Court, Fenchurch street London.

To Locomotive Engine Builders and Engineers.

THE Proprietors offer for rent for a term of years, with immediate possession, the splendid property, known as the BELLEVILLE IRON WORKS, situated on the Mississippi, directly opposite the City of New Orleans, and within 300 feet of the River, with which it is connected by fine wharves and landings.

The buildings are of brick, with slated roofs, and were erected in 1848 at a very heavy expense; are of a most substantial and durable character and admirably fitted for a Foundry and Machine Shops, or almost any mechanical business. They now contain a new and powerful Engine and Boiler and sufficient machinery, say, planing machines—lathes—boring machines, blacksmith's tools, &c., &c., to employ 100 mechanics, and could be put in working order in a few days. The Buildings cover a lot 300 feet square and are amply large to receive the necessary machinery for the use of 800 to 1000 workmen.

The terminus and depot of the New Orleans, Opelousas and Great Western Railroad is situated about 300 yards from the above property, which could be availed of to great advantage for the manufacture of Locomotives and Railroad work, generally as well as Steam Engines, Sugar Mills, and other descriptions of Machinery.

There are no Shops in New Orleans for the manufacture of Railroad Machinery, and as the Railroad Companies now organized in that city contemplate the construction of over 1000 miles of road,—a large part of which is already under contract,—the property now offered for lease offers a most eligible opportunity for parties desiring to contract to furnish the Engines and Machinery,—for those roads. Responsible contractors with their works on the spot would have an advantage over Northern Workshops in contracting for the Work of the Railroads terminating in New Orleans.

The Establishment and prospect of remunerating work to be secured immediately are worthy the attention of manufacturers and Engineers generally.

Applications from responsible parties will be promptly attended to, and to satisfactory parties the proprietors of the Works can offer favorable terms and arrangements.

Letters may be addressed to
R. B. SUMNER,
No. 61 Camp Street,
New Orleans;
and further information may be had by applying to Messrs. BARSTOW & POPE, Pine Street, New York.

1300 Tons Yorkshire T rail, weighing 56 lbs. to the yard, and of a superior quality daily due and for sale by,
NAYLOR & CO.

Oxford Furnace, N. J.

ESTABLISHED A. D. 1743.

THE Subscriber manufactures and keeps constantly on hand for sale, every variety and size of Railroad Wheels made from the celebrated Oxford Iron. All orders addressed to CHAS. SCRANTON, Oxford Furnace P. O., will be attended to promptly.
Sept. 11, 1852. 1y*

Book and Job Printing.

The undersigned have added to the PRINTING ESTABLISHMENT of the "RAILROAD JOURNAL," an extensive OFFICE for *BOOK AND JOB PRINTING*, which they are now prepared to execute in the BEST manner, and with DISPATCH. They respectfully solicit from RAILROAD COMPANIES, orders for the PRINTING of *Exhibits Time-tables, Circulars, Tickets, &c., &c.*

J. H. SCHULTZ & CO.
New York April 9, 1853.